

# **LABOR REQUIREMENTS AND OPERATING COSTS IN FAST-FOOD RESTAURANTS**

**Marketing Research Report No. 1033**

**Agricultural Research Service  
UNITED STATES DEPARTMENT OF AGRICULTURE**

## CONTENTS

	Page
Summary .....	1
Introduction .....	1
Characteristics of fast-food restaurants .....	2
Standard prime costs .....	6
Standard material costs .....	6
Standard direct labor costs .....	6
Standard indirect costs .....	9
Indirect labor costs .....	9
Overhead costs .....	11
Total standard indirect costs .....	13
Standard product costs and revenue residuals .....	13
Hamburger-type sandwiches .....	13
Fried chicken .....	20
Submarine sandwiches .....	24
Other hot food items .....	25
Beverages .....	29
Standard operating budgets and labor schedules .....	31
Standard operating budgets .....	32
Labor schedules .....	32
Opportunities for improving productivity .....	38
Appendix .....	40
Exhibit A—Glossary of terms .....	40
Exhibit B—Overhead and equipment costs .....	40

Washington, D.C.

Issued August 1975

## PREFACE

The increase in demand for food away from home has engendered an increase in the number of food service businesses. This growth trend, along with increased costs for wages, food, and equipment, coupled with shortages of qualified personnel in the labor force, has required management to assign top priority to increasing labor and facility efficiency. These increased costs concern not only the food service industry, but also consumers, wholesalers, and producers. Increased marketing costs, wherever they occur in the distribution channel between the farm gate and the dinner table, reflect lower returns to growers and processors and higher prices to consumers. This report is part of a broad program of the Agricultural Marketing Research Institute, Agricultural Research Service, aimed at increasing the efficiency of the marketing system.

Appreciation is expressed to Richard N. Brown, formerly executive vice president, the National Restaurant Association, and to Robert N. Smith, Vernon E. Cordell, and other members of the National Restaurant Association's ad hoc committee on USDA research for their assistance. The material presented in this report was developed under contract by Associated Food Industry Services (AFIS), Ltd., Rockville, Md.

Applicants for all Department programs will be given equal consideration without regard to race, color, sex, creed, or national origin.

Trade names are used in this publication solely for the purpose of providing specific information. Mention of trade names or companies does not constitute a guarantee or warranty of products by the U.S. Department of Agriculture or an endorsement by the Department over other products or manufacturers not mentioned.



# LABOR REQUIREMENTS AND OPERATING COSTS IN FAST-FOOD RESTAURANTS

By JOHN F. FRESHWATER, *industrial engineer, Agricultural Marketing Research Institute, Northeastern Region, Agricultural Research Service*

## SUMMARY

This publication was designed to provide managers of fast-food restaurants with basic operating data to enable them to determine the costs and man-hours required for a specified volume of menu items. Potential savings through improving current methods were developed from operating statements of the restaurants that participated in this research. The average fast-food restaurant studied had a man-hour productivity ratio of 53.8 percent.

However, if production requirements are predicted accurately, a 95.5-percent employee productivity level can be scheduled. At this level, over \$25,000 per restaurant would be realized in annual labor savings.

Potential labor savings that could result from using precooked and portioned chicken, from self-service, cafeteria-type operations, and from semiautomated, hamburger-cooking equipment are also presented.

## INTRODUCTION

An estimated 38 percent of the total dollar sales in restaurants was derived from fast-food operations during 1971. Dollar sales increased 40 percent since 1969, and the number of establishments, 24 percent. Fast-food restaurants are expected to hold a significant share of the food service market during the rest of the 1970's.

Data presented in this report should not be construed as being precise statistics representative of the current costs to produce a specific menu item. Rather, they are a comparison of the costs involved using various production techniques, methods, and equipment. Rapidly changing market conditions in the food industry make any attempt to achieve exactness with respect to costs of specific menu items an impossible task.

Today, fast-food operators do not have a reliable method to determine the costs of producing a specific menu item. The method most

commonly used by operators consists of the following five steps:<sup>1</sup>

1. Determine percent ratios (usually called points) of food, labor, and overhead costs to gross sales from the profit-and-loss statement.
2. Calculate cost of food or the ingredient for the specific menu item.
3. Compute dollar cost per point by dividing cost of the ingredient (step 2) by the number of food points (step 1).
4. Calculate costs of labor and overhead by multiplying the dollar cost per point (step 3) by the number of points for labor and overhead.
5. Figure total costs for the menu item by adding the costs for ingredients, labor, and overhead.

This method is not only costly but also unreliable, because wage rates, ingredient costs,

<sup>1</sup> Additional details concerning this method may be obtained free from the Texas Restaurant Association, P.O. Box 1429, Austin, Tex. 78767.

and menu prices usually do not fluctuate in the same ratio.

This study was designed to provide fast-food operators with management tools to evaluate labor utilization, production costs, and revenue residuals for individual menu items.<sup>2</sup> More specifically, the study was directed toward the development of standard productive labor time-and-cost values for fast-food service establishments with repetitive menus. Another objective of the study was to recommend improvements for labor productivity in fast-food operations.

When properly applied and analyzed, standard time-and-cost values provide the criteria for more perceptive and appropriate decisions regarding a food service operation. Standard time-and-cost measures provide management with: (1) Accurate data for the amount of man-hours required for a specific business volume, (2) a performance index that indicates the level of labor utilization, (3) a means of comparing the production costs for various methods of producing a specific menu item, and (4) a means of evaluating the need for or the effect of methods improvements and the time

period required to regain the capital investment. The immediate value of using standard time-and-cost values is improved labor utilization through better work scheduling and an effective means of pricing individual menu items to produce an equitable revenue residual.

The dollar values presented in this study for production costs and revenue residuals for individual menu items are not for universal use and adoption by the industry. The variability of labor rates; the quality, quantity, and price of food ingredients used for specific menu items; and the capital investment costs for equipment preclude the practicality of such application. However, the standard time values shown for individual menu items may be used by all fast-food operators using comparable operating practices and methods as basic building blocks for developing time-and-cost standards for a specific food service operation. The methodology used in developing labor schedules, material costs, and indirect expenses to individual menu items will also be valuable in the development of a comparable cost system for a specific food service operation.

## CHARACTERISTICS OF FAST-FOOD RESTAURANTS

Most fast-food restaurants have several common characteristics. For example, menus are repeated each day, and speed of service is emphasized. Most fast-food operators try to deliver an order within 3 minutes after the customer has placed it. Speed of service and quality of prepared food are dependent primarily on the care with which operations are scheduled and personnel are trained. Speed of service will also vary as a result of order size, menu variety, and customer delays in searching for money or deciding what to order. These variations can be minimized through effective personnel training programs.

Fast-food restaurants differ also according to type and variety of menu items, customer service, kitchen equipment, and restaurant layout. While some fast-food establishments restrict their menus to the fewest possible items, others offer more diversified menus. Generally, an establishment will have at least one primary

line such as hamburgers (and sometimes a secondary line such as fried chicken), several complementary items such as french fries and beverages, and supplementary items such as fish sandwiches and apple turnovers. The number of items varies from one fast-food firm to another and sometimes even among outlets within the same chain.

Types of equipment in fast-food establishments vary according to menu items. However, more often than not two establishments that offer similar menu items will also have similar equipment for preparing these items. For example, pressure oil-frying equipment for cooking chicken and regular oil-frying equipment for french fries will likely be similar from one establishment to another. Nevertheless, equipment for preparing some similar items might vary considerably. For example, this study includes three types of equipment for cooking hamburgers: A rotary conveyor-type broiler, a conveyor belt-type broiler, and grills.

<sup>2</sup> Refer to appendix exhibit A for glossary of terms.

From the standpoint of providing customer service, fast-food operations differ in several aspects. Some restaurants provide single-line cafeteria-style service where patrons may serve themselves or be served by attendants or both. Customers pay for their orders when checking out at the end of the cafeteria line. Other establishments provide service to customers by multiple lines. With this system, customers wait in a line at each cash register where they order, receive delivery, and pay all at the same instant. Some operators modify this method by having patrons order and pay at one station and then receive delivery at another.

Layouts of fast-food restaurants differ also according to whether the establishment is oriented primarily toward takeout or eat-in food service. Two basic layouts are illustrated in Figures 1 and 2. Figure 1 shows a fast-food restaurant with cafeteria-style service and seating for eat-in customers. Figure 2 shows an establishment with multiple-line takeout serv-

A particular fast-food restaurant's success status, which is measured in terms of productivity, sales volume, profit and loss, and rate of return on capital investment, directly reflects the impact of such intangible factors as employee morale, food quality, menu acceptance, and dining atmosphere. These factors exert dynamic impact, not only on productivity and financial statements, but also on

the consumer, who must decide "where to eat" or "should I bother to eat out?"

The data presented in this publication are based on the study and analyses of 12 fast-food restaurant operations. Each of the 12 restaurants that participated in this study served hamburger sandwiches as the primary line. All 12 restaurants sold french fries and assorted hot and cold beverages as complementary items. Twelve establishments sold fish sandwiches and apple turnovers as supplementary items, 9 served hotdog sandwiches, and 3 served roast beef sandwiches. Several restaurants served other supplementary items not included in this report because of their minor sales contribution and minimal labor requirements. Table 1 shows the sales profile of the businesses that participated in this research. The data shown in the Group I column were obtained from six establishments, while the data shown for Group II and Group III were obtained from three establishments for each group.

The 12 restaurants were selected to reflect differences in sales volume, in equipment for cooking hamburgers, and in types of service to patrons. Annual sales volumes ranged from \$200,000 to \$700,000. Of the 12 restaurants, 5 used rotary-conveyor broilers for cooking hamburgers, 6 used grills, and 1 used a straight-line conveyor broiler. Of the 12 establishments, 8 used multiple-line patron service, 3 used cafeteria-style self-service, and 1 used attendant-style cafeteria service.

TABLE 1.—Sales profile of fast-food restaurants by group<sup>1</sup>

Menu item	Group I		Group II		Group III	
	Ratio of dollar sales Percent	Ratio of units sold Percent	Ratio of dollar sales Percent	Ratio of units sold Percent	Ratio of dollar sales Percent	Ratio of units sold Percent
Hamburger-type sandwich	31	28	44	34	41	38
Chicken sandwich	17	4	--	--	--	--
Fish sandwich	--	--	--	--	10	8
Hot sandwich	3	2	6	4	1	1
Log sandwich	5	5	--	--	4	3
St. beef sandwich	--	--	5	2	--	--
Apple turnover	3	4	8	4	2	3
Fish fries	16	22	19	25	21	24
Cold beverages	25	35	28	31	21	28
Total	100	100	100	100	100	100

<sup>1</sup>Restaurants were classified into 3 groups on the basis of menu items offered to the general public.

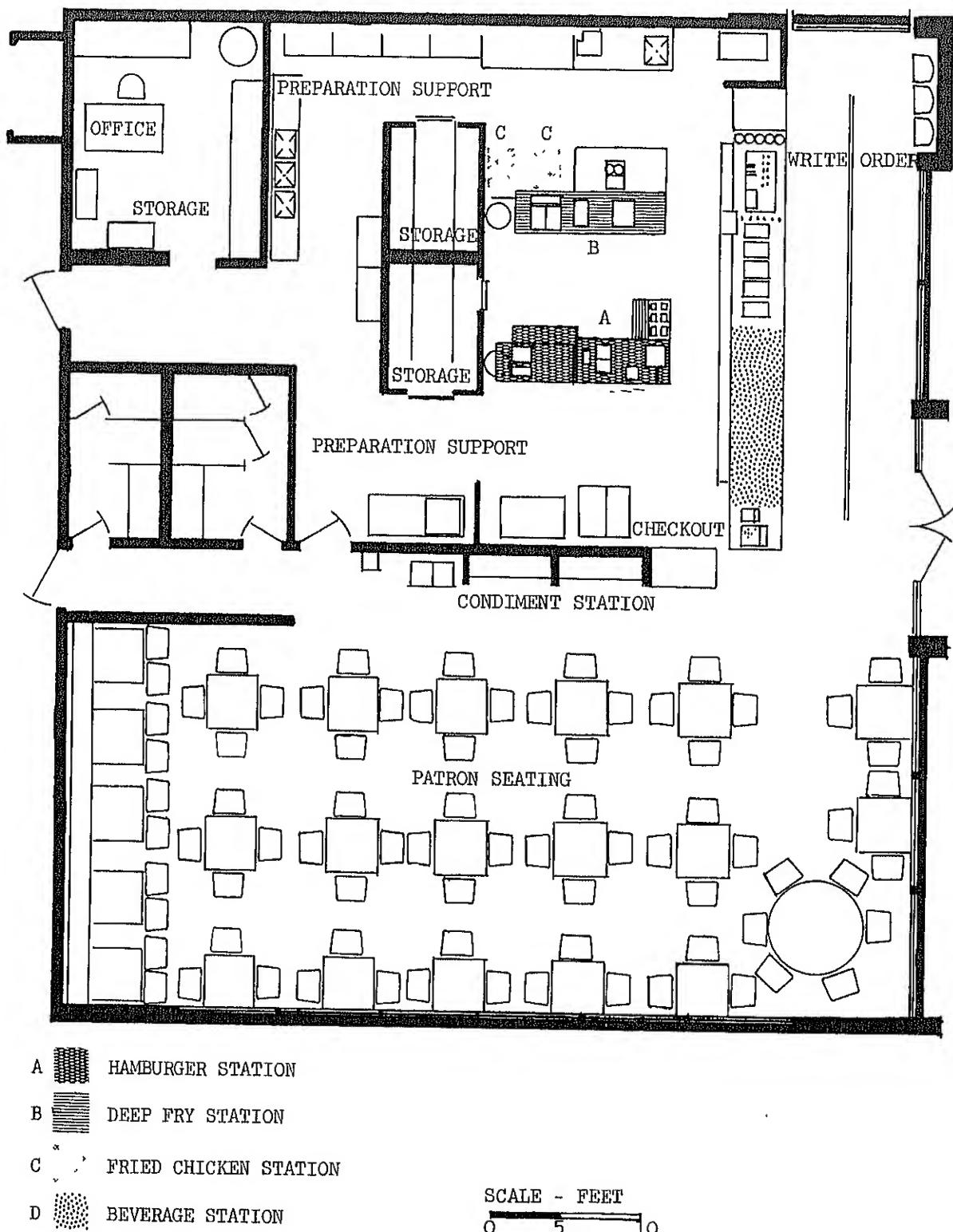
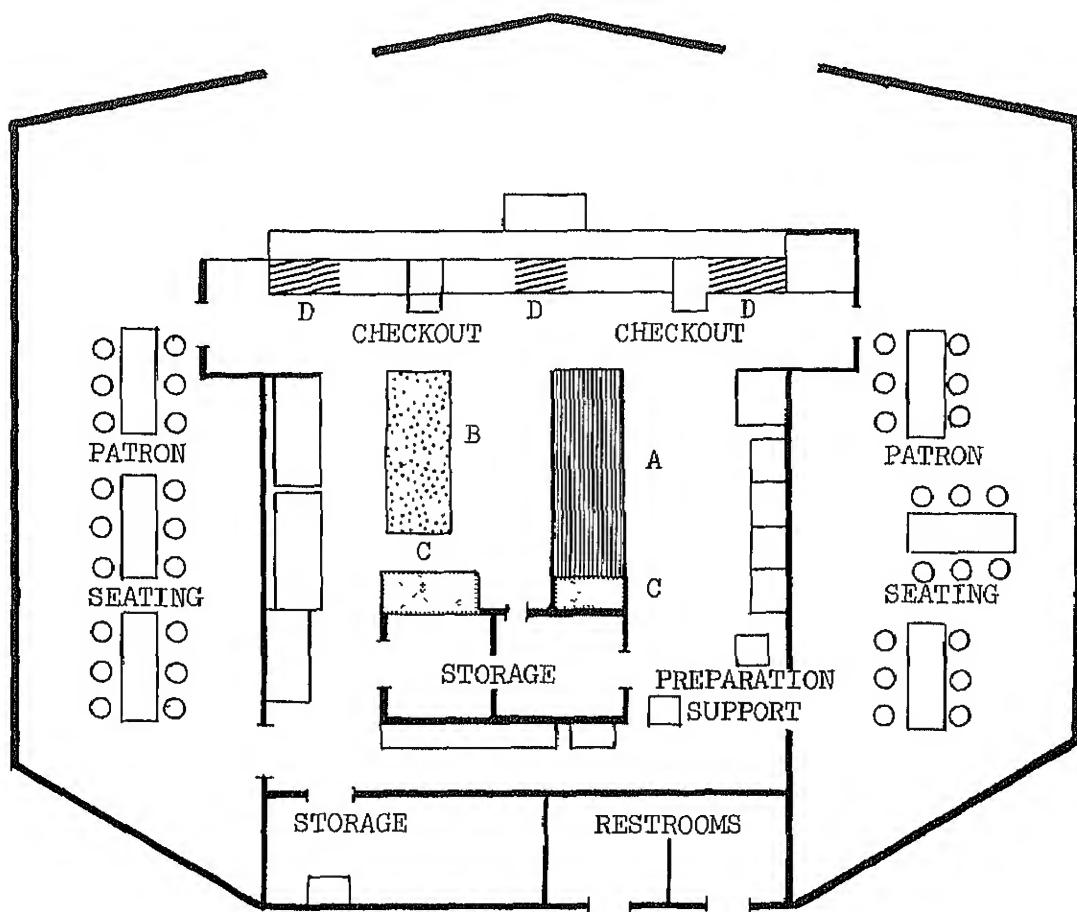


Figure 1.—Fast-food restaurant with attendant cafeteria service.



- A HAMBURGER STATION
- B DEEP FRY STATION
- C FRIED CHICKEN STATION
- D BEVERAGE STATION

SCALE - FEET  
0      5      10

Figure 2.—Fast-food restaurant with multiple-line service.

## STANDARD PRIME COSTS

Standard prime costs are the summation of standard material costs and standard direct labor costs. The term "standard" as used in this publication defines the specific procedure for developing material and labor quantities and costs and is not to be construed as a universal unit of measurement applicable in all fast-food restaurant operations. The data presented here are for the equipment and methods associated with the production of a specific menu item. The standard prime costs for the menu items evaluated in this research are presented in appendix tables 20 through 54.

### Standard Material Costs

The standard material costs in this publication were developed by determining (1) the purchase quantity and costs for each item of material, (2) the number of servings in the purchased quantity, and (3) the costs per 100 servings by dividing the purchase quantity costs by the number of servings and then multiplying by 100. Material loss was calculated by multiplying a loss factor of 1 percent by the total material costs per 100 servings for the menu item.

### Standard Direct Labor Costs

Standard direct labor costs were developed by multiplying the average hourly wage rate of \$1.944 for employees in the participating restaurants by standard direct labor man-hours per 100 servings. The hourly wage rate of \$1.944 includes such fringe benefits as meals, uniforms, health insurance, and social security. Standard direct labor is the time expended by employees in the production of a specific menu item.

Standard direct labor man-hours were developed for the process-and-preparation task. The process task consists of work elements that must be performed in a dynamic fashion as customers enter a restaurant. The preparation task generally consists of such work elements as unpacking and breading fresh poultry, shredding lettuce, and slicing tomatoes. The specific work elements that are associated with these two tasks are dependent on the production

method and the menu item. For example, the work elements associated with cooking and assembling a hamburger sandwich are grouped in the process task, since the product should be held in temporary storage under heat lamps at 150° F for no longer than 10 minutes to maintain acceptable quality. As opposed to this, the work elements associated with cooking chicken are grouped in the preparation task, since this product may be held in a steamer-type warmer for longer than 1 hour without impairing product quality.

Work elements at each fast-food restaurant were identified and analyzed to establish standardized or benchmark work elements that could be consistently identified and accurately timed with a decimal-minute stopwatch. All repetitive work elements have an accuracy level of plus or minus 5 percent at a 2-percent standard error level. Repetitive work elements occur more often than 10 times per day.

During the time studies, a pacerating factor was posted for each recorded time value. Normal time was then calculated by multiplying the pacerating factor by the recorded time value. Normal time values were analyzed for each restaurant and for each production method. In some instances, repetitive work elements did not have an accuracy level of plus or minus 5 percent. These time values were obtained from personnel who were either improperly trained or working under adverse conditions. In these circumstances, normal time values were developed from universal standard data.

Normal time values were then multiplied by a personal-and-fatigue allowance factor of 115 percent and by the number of occurrences of the time value per 100 menu items to derive standard time per 100 items. Also, an unavoidable delay allowance of 115 percent was applied to all work elements in the process task.

Table 2 summarizes the standard direct labor-time formulas for each menu item. Time formulas are shown so that appropriate values may be used for the alphabetic characters for a specific fast-food operation with comparable production methods, equipment, and raw materials.

The alphabetic characters shown in the time formulas represent the reciprocals of the items described in table 3. This table describes the limitations of alphabetic characters in standard

direct labor-time formulas. For example, the letter "A" represents the number 1 divided by the total number of grilled or broiled sandwiches sold per day. The minimum re-

TABLE 2.—*Summary of standard direct labor-time formulas*

Menu items and equipment	Standard time per 100 menu items served		
	Process task	Preparation task	
		Man-hours	
<b>Sandwiches:</b>			
Hamburger:			
Rotary-conveyor broiler .....	0.380		
Conveyor-belt broiler .....	.686 + .978B	} 0.052 + 7.108H + 19.052A	
Grill .....	.772 + .978B		
Hamburger with garnish:			
Rotary-conveyor broiler .....	1.012	} .438 + 7.108H + 19.052A	
Conveyor-belt broiler .....	1.019 + .978B		
Grill .....	1.004 + .978B + .848P		
Cheeseburger:			
Rotary-conveyor broiler .....	.880	} .082 + 7.108H + 19.052A	
Conveyor-belt broiler .....	.686 + .978B		
Grill .....	.851 + .978B + 1.460P		
Double hamburger:			
Rotary-conveyor broiler .....	2.153	} .499 + 7.108H + 19.052A	
Conveyor-belt broiler .....	1.849 + .978B		
Grill .....	1.428 + .978B + .848P		
Large hamburger:			
Rotary-conveyor broiler .....	1.168	2.245 + 7.108H + 19.052A	
Conveyor-belt broiler .....	.985	1.144 + 7.108H + 19.052A	
Grill .....	1.072 + .978B + .848P	.480 + 7.108H + 19.052A	
Submarine:			
Large .....	---	4.206	
Small .....	---	3.822	
Ham .....	---	3.001	
Large steak, grill .....	---	3.180 + 7.108H + 19.052A	
Small steak, grill .....	---	2.719 + 7.108H + 19.052A	
Hot roast beef, meat slicer:			
microwave oven .....	1.522	1.740 + 11.500D	
Fish, deep-fat frier .....	2.514	.354 + 7.108H + 38.717F	
Hotdog, steam-type warmer .....	.608	.210 + 17.010E	
Chicken, pressurized frier:			
Dinner .....	1.373	1.641 + 77.433F + 14.217H + 18.515G	
Family pack .....	2.220	4.888 + 38.717F + 7.108H + 18.515G	
Bucket .....	2.980	7.345 + 38.717F + 7.108H + 18.515G	
Parts .....	---	1.699 + 38.717F + 7.108H + 18.515G	
French-fried potatoes, deep-fat frier .....	.827	.004 + 7.108H + 38.717F	
Apple turnover, deep-fat frier .....	( <sup>1</sup> )	.148 + 7.108H + 38.717F	
Beverages:			
Coffee, pour-o-matic .....	( <sup>1</sup> )	.444	
Milk .....	( <sup>1</sup> )	.103	
Milkshake, shake machine .....	( <sup>1</sup> )	.803	
Orange drink, jet spray .....	( <sup>1</sup> )	.340	
Hot chocolate, dispenser .....	( <sup>1</sup> )	.048	
Carbonated drinks, dispenser .....	( <sup>1</sup> )	.066	

<sup>1</sup> Man-hours included in standard indirect, variable labor time.

ciprocal value that should be used for A is 0.001667 (1 divided by 600), and the average value used for A in subsequent sections of this report is 0.000952 (1 divided by 1,050).

Table 4 summarizes the standard man-hours for the process-and-preparation support task. The data shown in this table were developed by using the average reciprocal values given in table 3.

TABLE 3.—*Description and limitations of alphabetic characters used in standard direct labor-time formulas*

Alphabetic character	Description of reciprocal	Reciprocal value	
		Minimum Number	Average Number
A	Total number of grilled or broiled sandwiches per day	0.001667	0.000952
B	Number of buns that can be stored at work station	.083333	.020833
D	Total number of hot beef sandwich orders per day	.050000	.020000
E	Total number of hotdog orders per day	.040000	.009091
F	Total number of deep-fried orders per day	.002000	.001189
G	Total number of pressure-fried chicken orders per day	.020000	.009091
H	Total number of hot food orders per day	.000769	.000465
P	Number of hamburger patties that can be stored at work station	.020000	.009524

Sandwiches:

Hamburger:

Rotary-conveyor broiler	0.830	0.073	0.908	1.614	0.142	1.756
Conveyor-belt broiler	.707	.073	.780	1.374	.142	1.516
Grill	.792	.073	.865	1.540	.142	1.682

Hamburger with garnish:

Rotary-conveyor broiler	1.012	.454	1.466	1.967	.883	2.850
Conveyor-belt broiler	1.039	.454	1.493	2.020	.883	2.908
Grill	1.032	.454	1.486	2.006	.883	2.889

Cheeseburger:

Rotary-conveyor broiler	.830	.103	.938	1.614	.200	1.814
Conveyor-belt broiler	.706	.103	.809	1.372	.200	1.572
Grill	.885	.103	.988	1.720	.200	1.920

Double hamburger:

Rotary-conveyor broiler	2.153	.520	2.673	4.185	1.011	5.196
Conveyor-belt broiler	1.869	.520	2.389	3.688	1.011	4.644
Grill	1.456	.520	1.976	2.880	1.011	3.841

Large hamburger:

Rotary-conveyor broiler	1.166	2.266	3.432	2.267	4.405	6.672
Conveyor-belt broiler	.985	1.165	2.150	1.915	2.265	4.180
Grill	1.100	.451	1.551	2.188	.877	3.015

TABLE 4.—*Summary of standard direct labor time and cost based on study averages—Continued*

Menu item and equipment	Standard time per 100 menu items served			Standard cost per 100 menu items served <sup>1</sup>		
	Process task	Preparation task	Total	Process task	Preparation task	Total
	Man-hours	Man-hours	Man-hours	Dollars	Dollars	Dollars
<b>Submarine:</b>						
Large		4.206	4.206	---	8.176	8.176
Small		3.822	3.822	-	6.458	6.458
Ham		3.001	3.001	-	5.834	5.834
Large steak, grill		3.201	3.201	..	6.223	6.223
Small steak, grill		2.740	2.740	..	5.327	5.327
Hot roast beef, meat slicer, microwave oven	1.522	1.970	3.492	2.959	3.830	6.789
Fish, deep-fat frier	2.514	.403	2.917	4.887	.783	5.670
Hotdog, steam-type warmer	.608	.365	.973	1.182	.710	1.892
<b>Chicken, pressurized frier:</b>						
Dinner	1.373	1.908	3.281	2.669	3.709	6.378
Family pack	2.220	5.106	7.326	4.316	9.926	14.242
Bucket	2.980	7.562	10.542	5.793	14.701	20.494
Parts	..	1.916	1.916	..	3.725	3.725
French-fried potatoes, deep-fat frier	.327	.053	.380	.036	.103	.739
Apple turnover, deep-fat frier	(*)	.192	.192		.373	.373
<b>Beverages:</b>						
Coffee, pour-o-matic	(*)	.444	.444	---	.863	.863
Milk	(*)	.103	.103	---	.200	.200
Milkshake, shake machine	(*)	.803	.803	---	1.561	1.561
Orange drink, jet spray	(*)	.840	.840	---	.661	.661
Hot chocolate, dispenser	(*)	.048	.048	---	.093	.093
Carbonated drinks, dispenser	(*)	.066	.066	---	.128	.128

<sup>1</sup> Standard cost = standard time  $\times$  \$1.944 average hourly wage rate.<sup>2</sup> Man-hours included in standard indirect, variable labor time.

## STANDARD INDIRECT COSTS

Standard indirect costs consist of two cost components, indirect labor and overhead. Indirect labor costs are the payroll expense for hourly employees to perform work that cannot be readily identified with the production of a specific menu item. Overhead costs consist of such items as management salaries, facilities, and equipment.

### Indirect Labor Costs

Indirect labor costs are the payroll expense to perform the customer service task and the general support task. The customer service task consists of work associated with taking a customer's order, collecting individual menu

items for the order, adding the sales prices for the menu items, and receiving payment and making change. The amount of labor required to perform this task is dependent on the number of customers and the type of customer service.

The three types of customer service evaluated in this research were attendant-service cafeteria, self-service cafeteria, and multiple-line service. As implied, multiple-line service has more than one customer-queuing line, especially during peak meal periods, while both cafeteria-type services have a single queuing line. An attendant-service cafeteria's employees write the order, place the menu items selected

in a paper bag or on a tray, and check out the order.

A self-service cafeteria's employees check out the order. No list is written, and the customer collects or picks up individual menu items from a counter. Figure 3 shows a customer obtaining a salad at a self-service cafeteria. Multiple-line service uses one employee per customer to write up, fill, and check out the order. Figure 4 shows multiple-line service.

Table 5 shows the time and costs for the three types of customer service. The average cost of \$0.740 per 100 menu items was used in developing standard product costs for specific menu items in subsequent sections of this report. The standard productive capacities per hour are 45 customers for the attendant-service cafeteria, 129 for the self-service cafeteria, and 55 for multiple-line service.

General support tasks consist of work associated with opening a fast-food restaurant in the



PN-3884

Figure 3.—Self-service cafeteria.



PN-3886

Figure 4.—Multiple-line service.

TABLE 5.—*Standard time and costs for customer service task—single cash register*

Type service	Time per 100 customers served	Costs per 100 customers served <sup>1</sup>	Costs per 100 items served <sup>2</sup>
	Hours	Dollars	Dollars
Attendant-service cafeteria .....	2.175	4.228	1.016
Self-service cafeteria .....	.774	1.505	.362
Multiple-line service ..	1.804	3.507	.843
Average .....	1.584	3.080	.740

<sup>1</sup> Based on an average hourly pay rate of \$1.944.

<sup>2</sup> Based on average day's business volume of 3,096 menu items sold to 744 customers, or 4.16 menu items per customer.

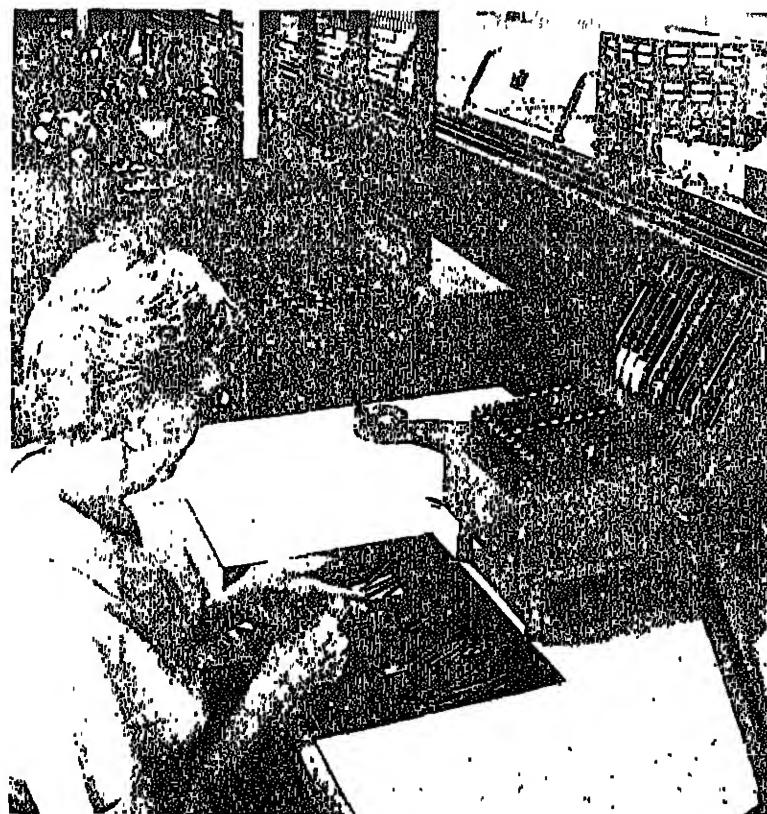
morning and closing it in the evening. General support includes receiving food, unloading supplies, shipping disposables, and cleaning up the

leftovers. Figure 5 shows an employee closing out a cash register; this task is typical of general support work. Table 6 shows the standard time and costs for the general support tasks on a daily 100-item-menu basis.

### Overhead Costs

Overhead costs include procurement of the building, purchase and installation of food production equipment and customer service facilities, and payment of management salaries. Costs of owning equipment are based on manufacturers' list prices plus interest rates on investments.

An annual overhead cost of \$48,510 for such items as lease of land and improvements, taxes, contingencies and reserves, building, multiple-use refrigeration equipment, and management salaries was prorated to specific menu items based on the study average of 1,124,000 menu



PN-8886

Figure 5.—Closing out a cash register.

items sold per year. Costs of food production equipment that could be readily identified to specific menu items were prorated on the basis of the average number of specific menu items processed with the equipment or through it.

Table 7 shows the distribution of hundreds of

menu items produced per year for specific items, the distribution of equipment costs to menu items, and total overhead costs per 100 menu items. Additional details concerning equipment and overhead costs are presented in appendix exhibit B.

TABLE 6.—*Standard time and costs for general support task<sup>1</sup>*

Item	Time per day	Costs per day	Time per 100 menu items	Costs per 100 menu items
	Hours	Dollars	Hours	Dollars
Closing service counter	0.470	0.914	0.015	0.029
Closing after business hours	2.952	5.739	.095	.185
Receiving supplies	.978	1.901	.032	.062
Shipping disposals	.382	.645	.011	.021
Total	4.732	9.199	.163	.297

<sup>1</sup> Based on an hourly wage rate of \$1.944 and daily sales of 3,096 menu items.

TABLE 7.—*Distribution of overhead costs*

Menu item	Menu items per year	Equipment costs		Total costs per 100 items <sup>1</sup>
		Annual	Per 100 items	
	Thousands	Dollars	Dollars	Dollars
<b>Hamburger-type sandwiches:</b>				
Rotary broiler	3,700	980	0.265	4.581
Conveyor-belt broiler	3,700	1,130	.305	4.621
Grill	3,700	680	.184	4.500
Chicken	400	865	2.168	6.479
Submarine sandwich	280	143	.511	4.827
French fries	2,250	327	.145	4.461
Coffee	480	41	.085	4.401
Milk	170	---	---	4.816
Milkshake	310	1,675	5.403	9.719
Hot chocolate	70	25	.857	4.673
Orange drink	100	83	.830	5.146
Carbonated drinks	2,300	1,063	.462	4.778
Roast beef sandwich	180	758	4.211	8.527
Fish sandwich	200	63	.315	4.631
Hotdog	400	113	.283	4.599
Apple turnover	400	58	.145	4.461

<sup>1</sup> Total costs = equipment costs + other overhead costs. Other overhead costs =  $\$48,510 \div 11,240$  for the 100 items = \$4.316 per 100 menu items.

### Total Standard Indirect Costs

The total standard indirect costs used to develop product costs for specific menu items are shown in the following list. These total costs are the sum of the indirect labor costs for the customer service task (\$0.740 per 100 menu items) from table 5, the indirect labor costs for the general support task (\$0.297 per 100 menu items) from table 6, and the overhead costs for specific menu items from table 7.

Menu item	<i>Total indirect costs per 100 items</i>
Hamburger-type sandwiches:	
Rotary broiler	\$ 5.618
Conveyor-belt broiler	5.658
Grill	5.537
Chicken	7.516
Submarine sandwich	5.864
French fries	5.498
Coffee	5.438
Milk	5.358
Milkshake	10.756
Hot chocolate	5.710
Orange drink	6.183
Carbonated drinks	5.815
Roast beef sandwich	9.584
Fish sandwich	5.668
Hotdog	5.636
Apple turnover	5.498

### STANDARD PRODUCT COSTS AND REVENUE RESIDUALS

Standard product costs are the sum of standard prime costs plus indirect costs. Revenue residual was determined by subtracting the selling price of the menu item from the standard product costs. Revenue residual represents profit for a specific menu item before general taxes, franchise fees, advertising expenses, and reserve allowances for opening new outlets and for offsetting current unprofitable ones.

The cost formula for determining revenue residuals is revenue residual = selling price - product cost. The cost formula for product cost is product cost = prime cost + indirect cost. As presented previously in this report, the cost formulas for prime and indirect costs are prime cost = material cost + process task cost + preparation task cost; indirect cost = indirect labor cost + overhead cost; and indirect labor cost = customer service task cost + general support task cost. Table 8 summarizes the product costs and revenue residuals for each menu item.

#### Hamburger-Type Sandwiches

The standard product costs and revenue residuals for five types of hamburger sandwiches were developed during this research. The first type of sandwich, hamburger, consists of a toasted bun, a single meat patty weighing 1.6 ounces, and sauce. The second type of sandwich, hamburger with garnish, has the same material as the hamburger sandwich plus a tomato slice and shredded lettuce. The

third type of sandwich, cheeseburger, is the same as the hamburger with one exception: A 0.44-ounce slice of cheese is added. The fourth type of sandwich, double hamburger, consists of a toasted bun with three segments: Two 1.6-ounce meat patties, sauce, lettuce, a 0.44-ounce slice of cheese, a pickle slice, and catsup. The fifth type of sandwich, large hamburger, consists of a toasted bun, a 4-ounce meat patty, a pickle slice, a tomato slice, lettuce, and mayonnaise. Frozen, portioned meat patties, head lettuce, whole tomatoes, sliced cheese, and pickles are used in these sandwiches.

Standard product costs and revenue residuals for each of the five hamburger-type sandwiches were developed for production methods associated with a rotary-conveyor broiler, a conveyor-belt broiler, and a grill. Figure 6 shows a rotary-conveyor broiler. This broiler has two circular wire racks that revolve through a semicircular tunnel that contains electric heating elements. Patties are normally broiled on the top rack, and buns are toasted on the bottom rack.

Figure 7 shows a conveyor-belt broiler. This broiler has two motor-driven wire belts that pass through a straight tunnel that contains electric heating elements. The patties are normally broiled on the wider belt, and buns are toasted on the smaller adjacent belt. Variable belt speed controls are provided for each belt. Figure 8 shows a grill. Both buns and patties are toasted and grilled on the flat grill surface.

TABLE 8.—Summary of product costs and revenue residuals

Menu item and equipment	Direct labor costs				Prime costs	Product costs <sup>1</sup>	Selling prices	Revenue residuals
	Material costs	Process task	Preparation task	Dollars				
Sandwiches:								
Hamburger:								
Rotary-conveyor broiler . . . . .	10.448	1.614	.142	12.204	17.822	25	7.178	
Conveyor-belt broiler . . . . .	10.448	1.374	.142	11.964	17.622	25	7.378	
Grill . . . . .	10.488	1.540	.142	12.130	17.667	25	7.388	
Hamburger with garnish:								
Rotary-conveyor broiler . . . . .	11.759	1.967	.883	14.609	20.227	35	14.773	
Conveyor-belt broiler . . . . .	11.759	2.020	.883	14.662	20.320	35	14.680	
Grill . . . . .	11.759	2.006	.883	14.648	20.185	35	14.815	
Cheeseburger:								
Rotary-conveyor broiler . . . . .	12.345	1.614	.200	14.159	19.777	30	10.223	
Conveyor-belt broiler . . . . .	12.345	1.372	.200	13.917	19.575	30	10.425	
Grill . . . . .	12.345	1.720	.200	14.265	19.802	30	10.198	
Double hamburger:								
Rotary-conveyor broiler . . . . .	22.322	4.185	1.011	27.518	33.136	50	16.864	
Conveyor-belt broiler . . . . .	22.322	3.633	1.011	26.966	32.624	50	17.376	
Grill . . . . .	22.322	2.830	1.011	26.163	31.700	50	18.300	
Large hamburger:								
Rotary-conveyor broiler . . . . .	25.003	2.267	4.405	31.675	37.293	55	17.707	
Conveyor-belt broiler . . . . .	25.003	1.915	2.265	29.183	34.841	55	20.159	
Grill . . . . .	25.003	2.138	.877	28.018	33.555	55	21.445	
Submarine:								
Large . . . . .	46.285	---	8.176	54.461	60.325	99	38.675	
Small . . . . .	29.914	---	6.458	36.372	42.236	79	36.764	
Ham . . . . .	32.587	---	5.884	38.421	44.285	79	34.715	
Large steak . . . . .	46.431	---	6.223	52.654	58.518	129	70.482	
Small steak . . . . .	32.686	---	5.827	38.013	43.877	99	55.128	
Hot roast beef . . . . .	41.804	2.959	3.830	48.593	58.157	79	20.848	
Fish . . . . .	17.532	4.887	.788	23.202	28.870	40	11.130	
Hotdog . . . . .	12.078	1.182	.710	13.970	19.606	30	10.394	
Chicken:								
Dinner . . . . .	81.488	2.669	3.709	87.866	95.382	125	29.618	
Family pack . . . . .	206.812	4.816	9.926	221.054	228.570	255	26.430	
Bucket . . . . .	325.663	5.793	14.701	356.157	363.678	435	71.827	
Parts . . . . .	38.470	---	3.725	42.195	49.711	66	16.289	
French-fried potatoes . . . . .	5.601	.636	.103	6.340	11.838	20	8.162	
Apple turnover . . . . .	8.927	--	.373	9.800	14.798	20	5.202	
Beverages:								
Coffee . . . . .	3.980	---	.863	4.843	10.281	15	4.719	
Milk . . . . .	10.100	---	.200	10.300	15.653	15	4.653	
Milkshake . . . . .	6.502	---	1.561	8.063	18.819	25	6.181	
Orange drink . . . . .	5.526	---	.661	6.187	12.370	25	12.630	
Hot chocolate . . . . .	6.277	---	.098	6.370	12.080	15	2.920	
Carbonated drinks . . . . .	4.884	---	.128	5.012	10.827	25	14.173	

<sup>1</sup> Product costs = prime costs + indirect expenses.

\* The sale of milk generally provides a deficit revenue residual.

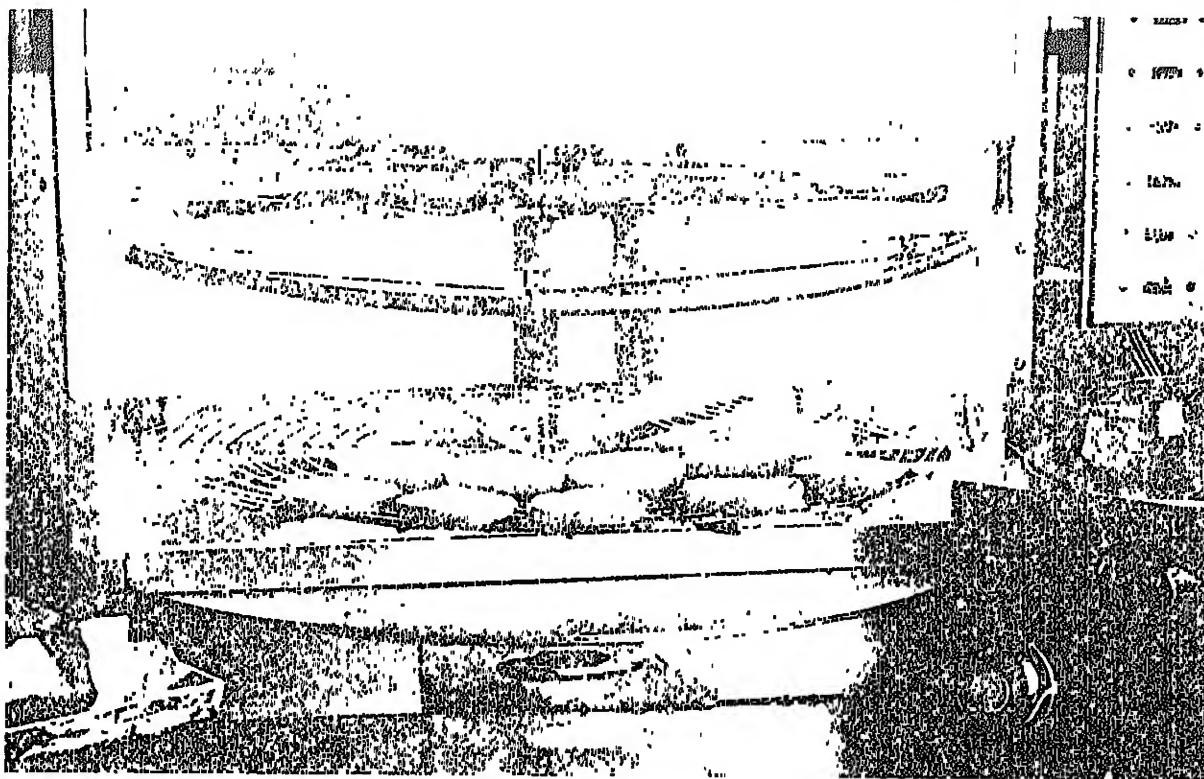


Figure 6.—Rotary-conveyor broiler.

PN-3887

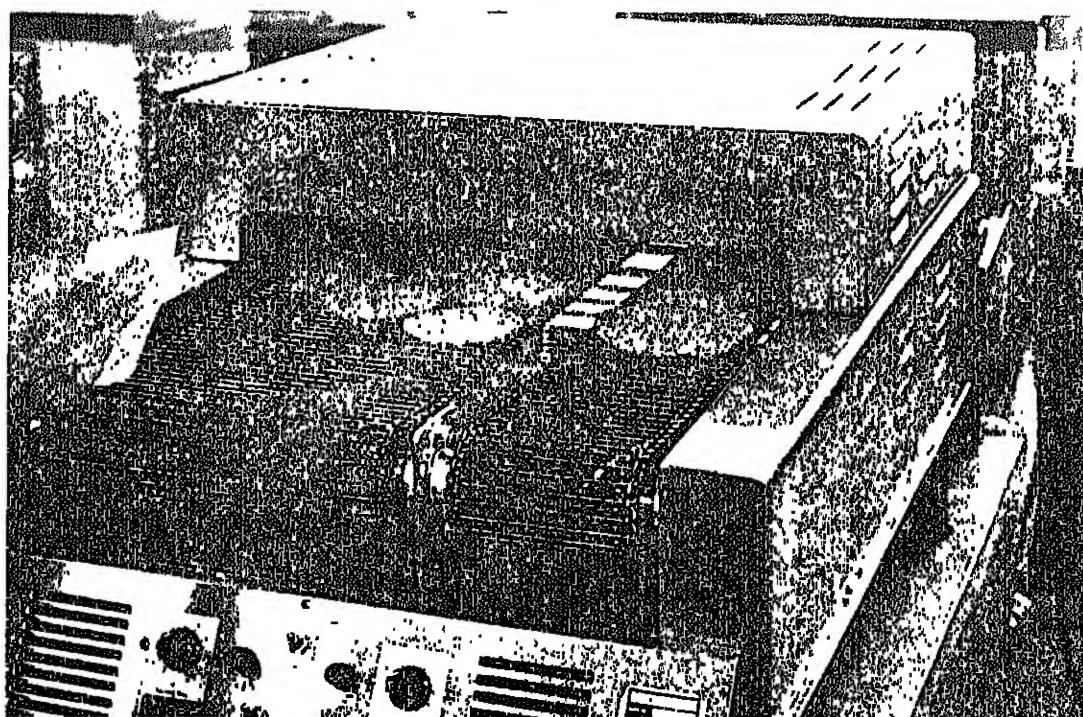
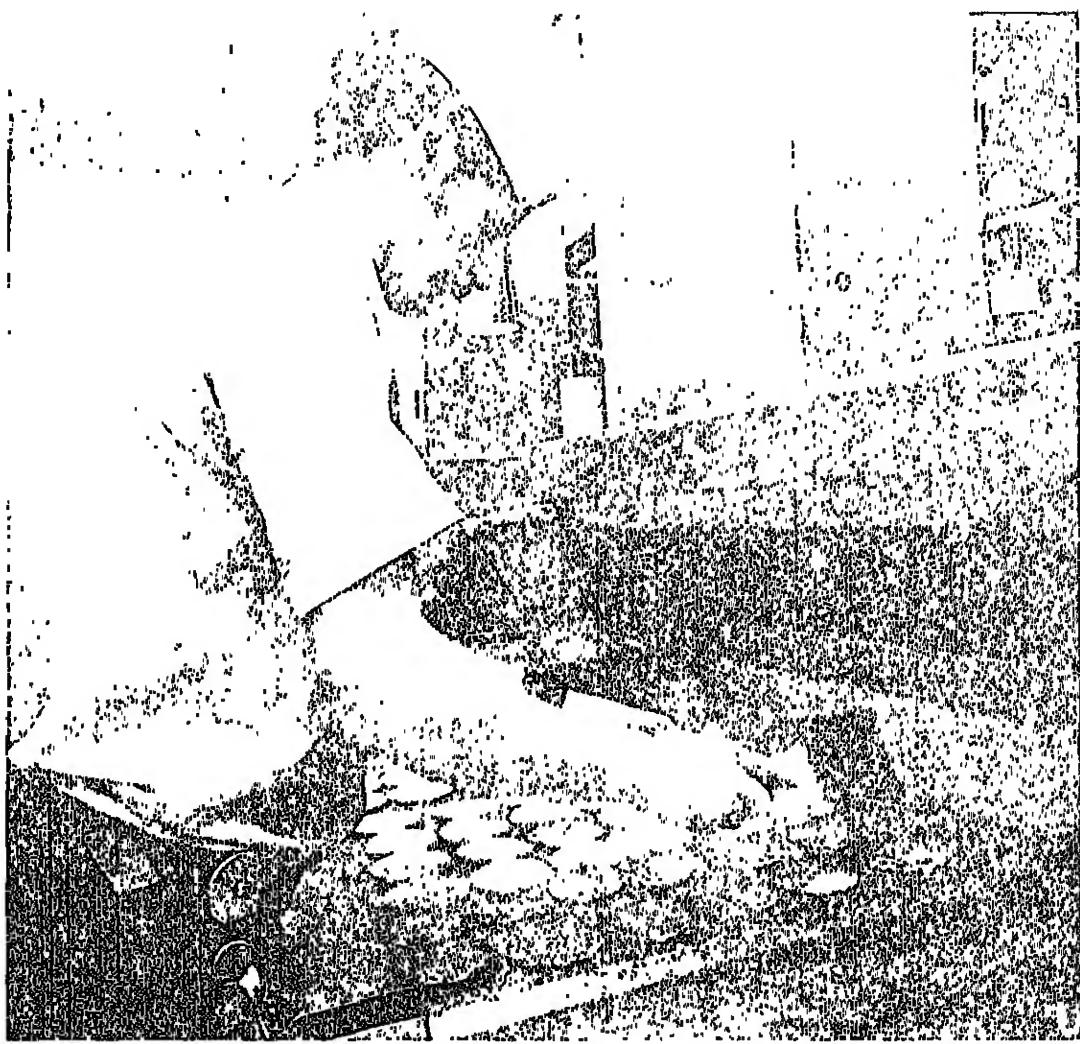


Figure 7.—Conveyor-belt broiler.

PN-3888



PN-3889

Figure 8.—Grill.

The temperature of the grill surface is regulated by adjustable controls.

Figure 9 is a flow process chart that shows the production method for the two types of conveyor broilers for hamburger, hamburger with garnish, cheeseburger, and double hamburger sandwiches. The major work elements are summarized for the general support, preparation support, process, and customer service tasks.

As shown in the process task, an equipment delay occurs when conveyor broilers are used. The broiler operator is able to place and remove more buns and patties in a given time than the equipment can process. He experiences this

machine delay after initially loading buns and patties onto the conveyor. The operator is delayed from placing or removing additional buns and patties until the conveyor has traveled sufficiently into the tunnel to expose vacant conveyor space.

The standard productive capacity per hour for this method for the rotary-conveyor broiler is 120 hamburgers or cheeseburgers, or 98 hamburgers with garnish, or 46 double hamburgers. The standard productive capacity per hour for this method for the conveyor-belt broiler is 141 hamburgers or cheeseburgers, or 96 hamburgers with garnish, or 53 double hamburgers.

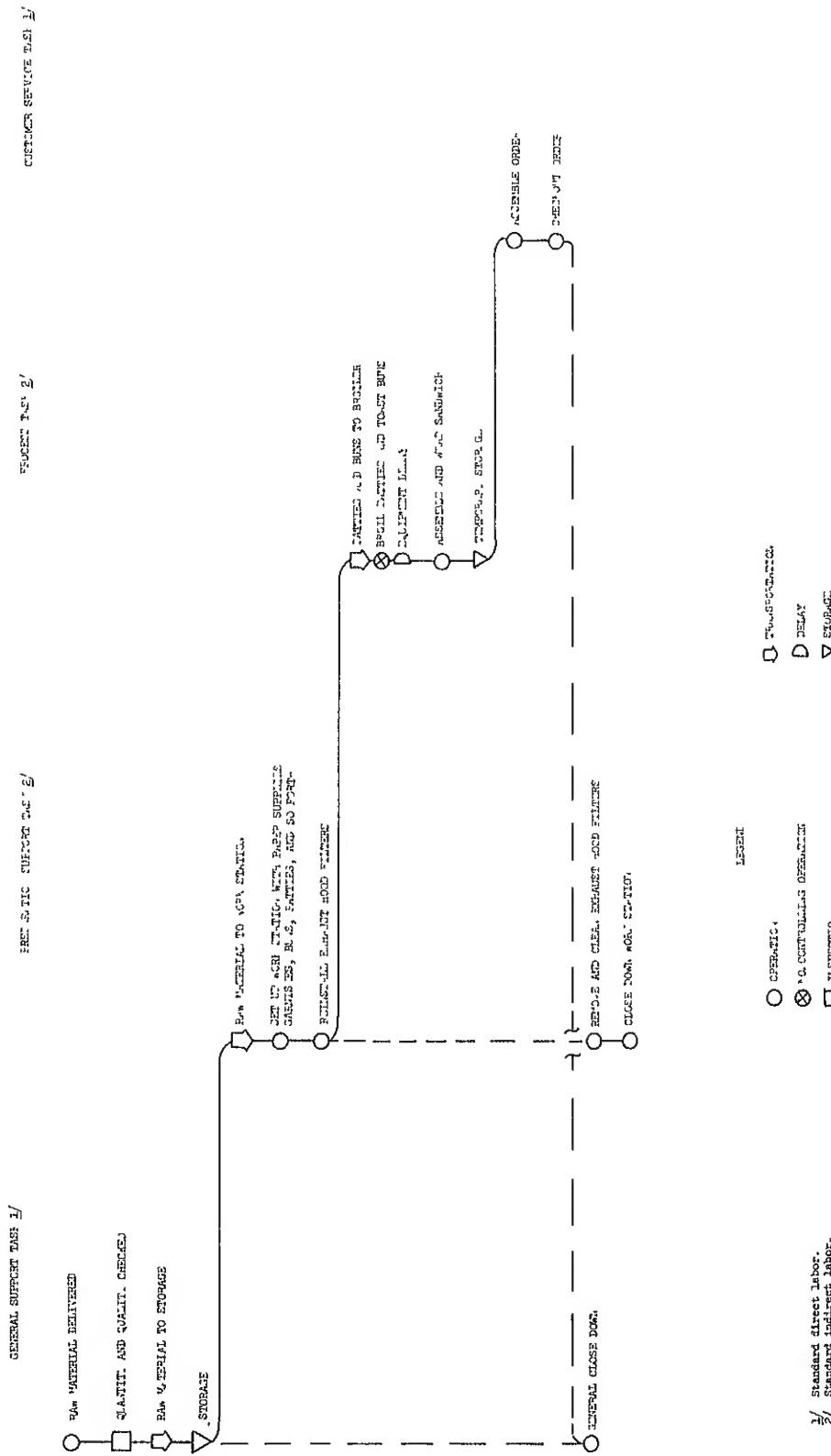


Figure 9.—Flow process chart for conveyor broilers.

After the patties and buns have been processed through the broiler, they are assembled, wrapped, and placed in temporary storage under heat lamps. Figure 10 shows an employee assembling a sandwich. The method of assembling a double hamburger varies from that shown in this figure in three respects: (1) Two patties are used, (2) the patties are separated with a bun section between them, and (3) a circular paper collar is placed around the sandwich before wrapping.

Figure 11 is a flow process chart that shows the production method of the two types of conveyor broilers for the large hamburger sandwich. This flow process chart is similar to that shown in figure 9 except that transferring patties and buns to the broiler and subsequent equipment delays occur in the preparation

support task. The patties are broiled and the buns toasted before the meal period. Then they are stored in a steamer-type warmer as shown in figure 12. The standard productive capacity per hour of this method is 85 large hamburgers with the rotary broiler and 101 large hamburgers with the conveyor-belt broiler.

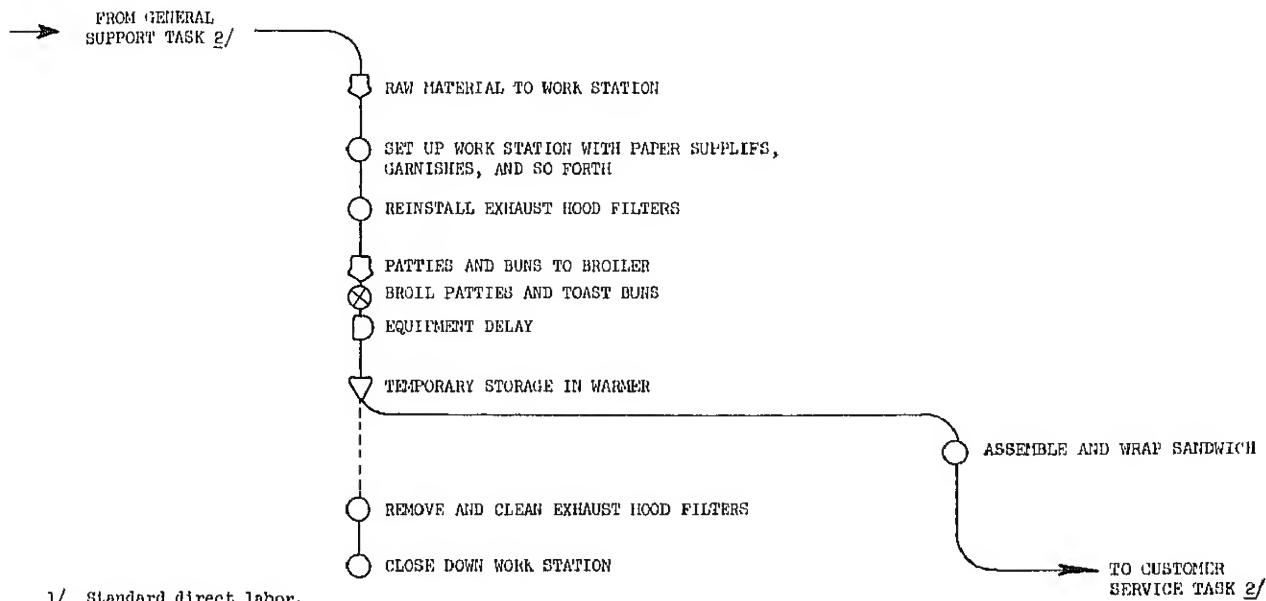
The production method for the grill for all five types of hamburger sandwiches is similar to that shown in figure 9 with one important exception: No equipment delays. With the grill, the standard production capacity per hour is 126 hamburgers, or 96 hamburgers with garnish, or 112 cheeseburgers, or 68 double hamburgers, or 90 large hamburgers.

Table 8 shows the standard product costs and the revenue residuals for each of the five sandwiches with a rotary-conveyor broiler, a



Figure 10.—Employee assembling a sandwich.

PN-8890

PREPARATION SUPPORT TASK 1/PROCESSED TASK 1/

1/ Standard direct labor.  
2/ Standard indirect labor.

Figure 11.—Flow process chart for conveyor broilers.



Figure 12.—Buns placed in storage in a steamer-type warmer.

conveyor-belt broiler, and a grill. The data in the standard product cost column of the table show that the costs of owning and operating conveyor-type broilers and grills are comparable for the production of hamburger, hamburger with garnish, cheeseburger, and double hamburger sandwiches. The production of large hamburger sandwiches, however, is approximately \$3 less expensive with either conveyor-belt broilers or grills than with rotary-conveyor broilers. The primary reason for the increased cost in processing large hamburger sandwiches on rotary broilers is that the meat patties must pass through the tunnel twice before they are cooked. This increased cost is also reflected in the direct labor cost of \$6.672 for rotary-conveyor broilers as opposed to \$4.180 for conveyor-belt broilers.

The ratios of standard costs and revenue residuals to sales for hamburger-type sandwiches processed with the three types of equipment are shown in table 9. The data partly reflect the marketing strategy of fast-food restaurant operators. This strategy is to establish minimal levels for selling prices and revenue residuals and then to maximize the volume

TABLE 9.—*Ratios of standard costs and revenue residuals to sales prices for hamburger-type sandwiches*

Menu item and equipment	Material	Direct	Prime	Product	Revenue	Ratios
	costs	labor	costs	costs	residuals	of units
	Percent	Percent	Percent	Percent	Percent	Percent
<b>Hamburger:</b>						
Rotary-conveyor broiler	41.79	7.02	48.82	71.29	28.71	53
Conveyor-belt broiler	41.79	6.06	47.85	70.49	29.51	53
Grill	41.79	6.73	48.52	70.67	29.88	53
<b>Hamburger with garnish:</b>						
Rotary-conveyor broiler	38.60	8.14	41.74	67.79	42.21	5
Conveyor-belt broiler	38.60	8.29	41.89	68.06	41.94	5
Grill	38.60	8.25	41.85	67.67	42.33	5
<b>Cheeseburger:</b>						
Rotary-conveyor broiler	41.15	6.05	47.20	65.92	34.08	19
Conveyor-belt broiler	41.15	5.24	46.39	65.25	34.75	19
Grill	41.15	6.40	47.55	66.01	33.99	19
<b>Double hamburger:</b>						
Rotary-conveyor broiler	44.64	10.39	55.03	66.27	33.73	8
Conveyor-belt broiler	44.64	9.29	53.93	65.25	34.75	8
Grill	44.64	7.68	52.32	63.40	36.60	8
<b>Large hamburger:</b>						
Rotary-conveyor broiler	45.46	12.13	57.59	67.81	32.19	15
Conveyor-belt broiler	45.46	7.60	53.06	63.35	36.65	15
Grill	45.46	5.48	50.94	61.01	38.99	15

for the items that require the least amount of labor. Conversely, the sale of high-labor, high-cost items is discouraged by maximizing selling prices and revenue residuals. As shown in table 9, the hamburger sandwich has lowest overall ratios of direct labor cost and revenue residual. Also, consumers purchase more hamburger sandwiches than any other type of sandwich.

### Fried Chicken

The standard product costs and revenue residuals for four types of fried-chicken items were developed. The first item, chicken dinner, consists of three pieces of fried chicken, 4 ounces of coleslaw, two biscuits, honey, and 4 ounces of french fries. The second item, chicken family pack, consists of nine pieces of fried chicken, 12 ounces of coleslaw, six biscuits, and honey. The third item, chicken bucket, consists of 18 pieces of fried chicken. The fourth item, chicken parts, consists of two pieces of fried chicken and one biscuit. The chicken in the first three items is served hot, while the chicken in the fourth item is served cold. Portioned chicken parts, frozen french-

fried potatoes, packaged biscuit dough, portioned packages of honey, and prepared coleslaw are used in the production of these items.

Standard product costs and revenue residuals were developed for the production methods associated with a pressurized deep-fat frier for frying chicken, a conventional deep-fat frier for frying potatoes and biscuits, and a steamer-type warmer for holding chicken and biscuits. Figure 13 shows an employee placing chicken in a pressurized deep-fat frier, figure 14 a conventional deep-fat frier, and figure 15 a steamer-type warmer.

Figure 16 is a flow process chart that shows the production methods for chicken dinners. As shown in the chart under the preparation support task, bulk coleslaw is packaged and chicken is breaded and placed in storage in the reach-in cooler. Chicken parts are removed, fried, and placed in the warmer. Biscuits are removed from a cylindrical container, fried, and placed in the warmer. French-fried potatoes are fried, packaged, and placed in temporary storage during the process task.

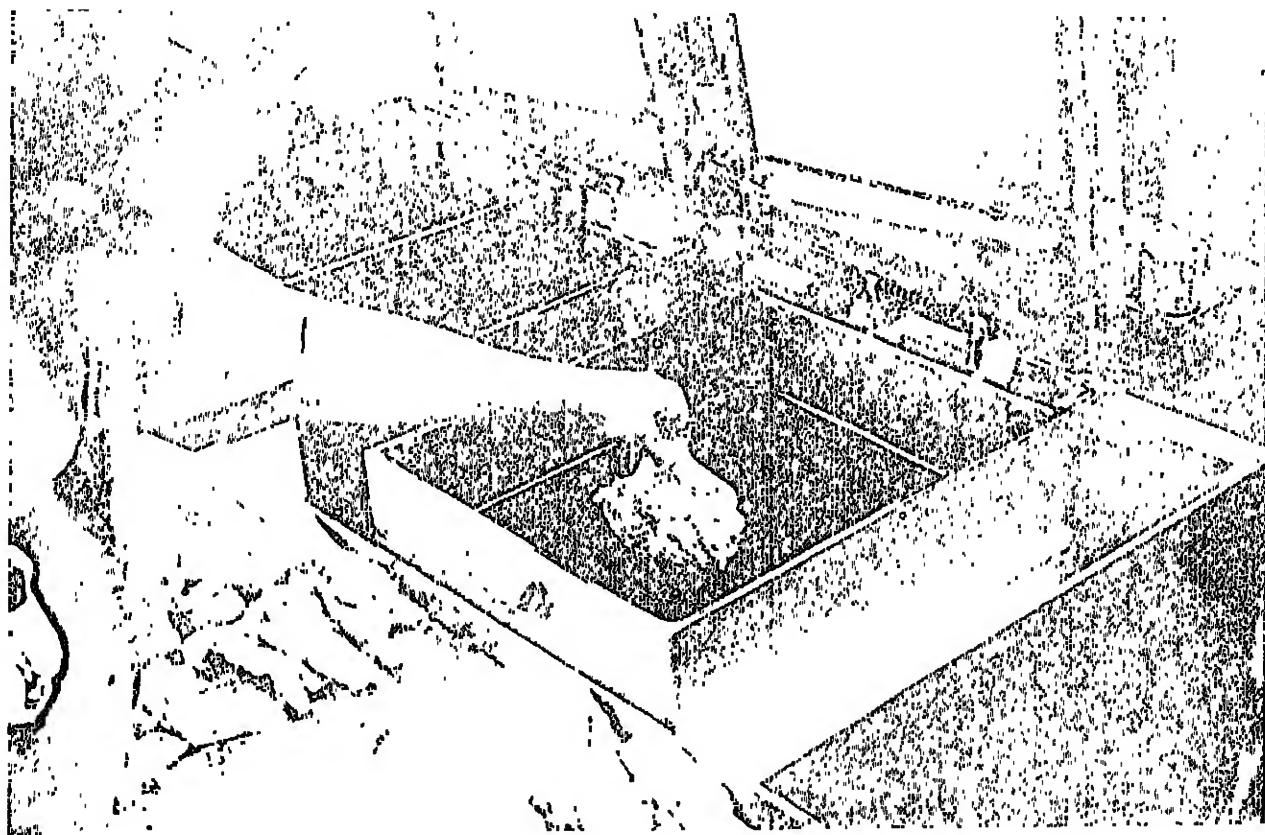


Figure 13.—Pressurized deep-fat frier.

PN-3802

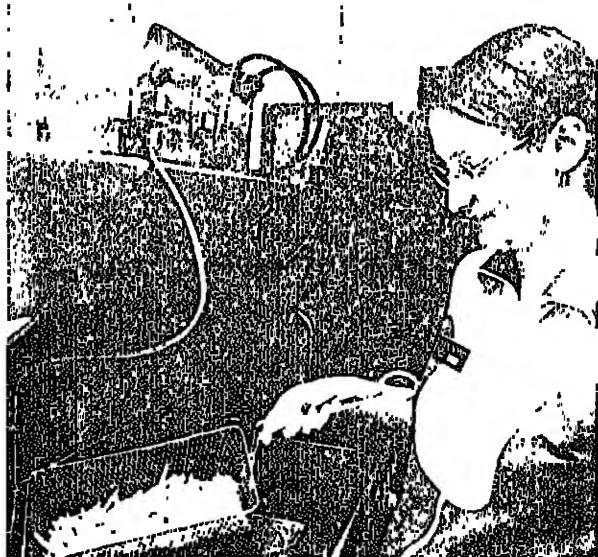


Figure 14.—Conventional deep-fat frier.

PN-3803

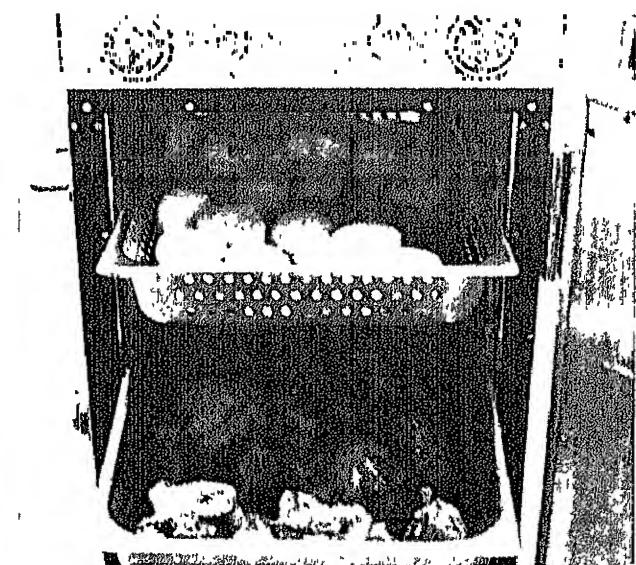


Figure 15.—Steamer-type warmer.

PN-3804

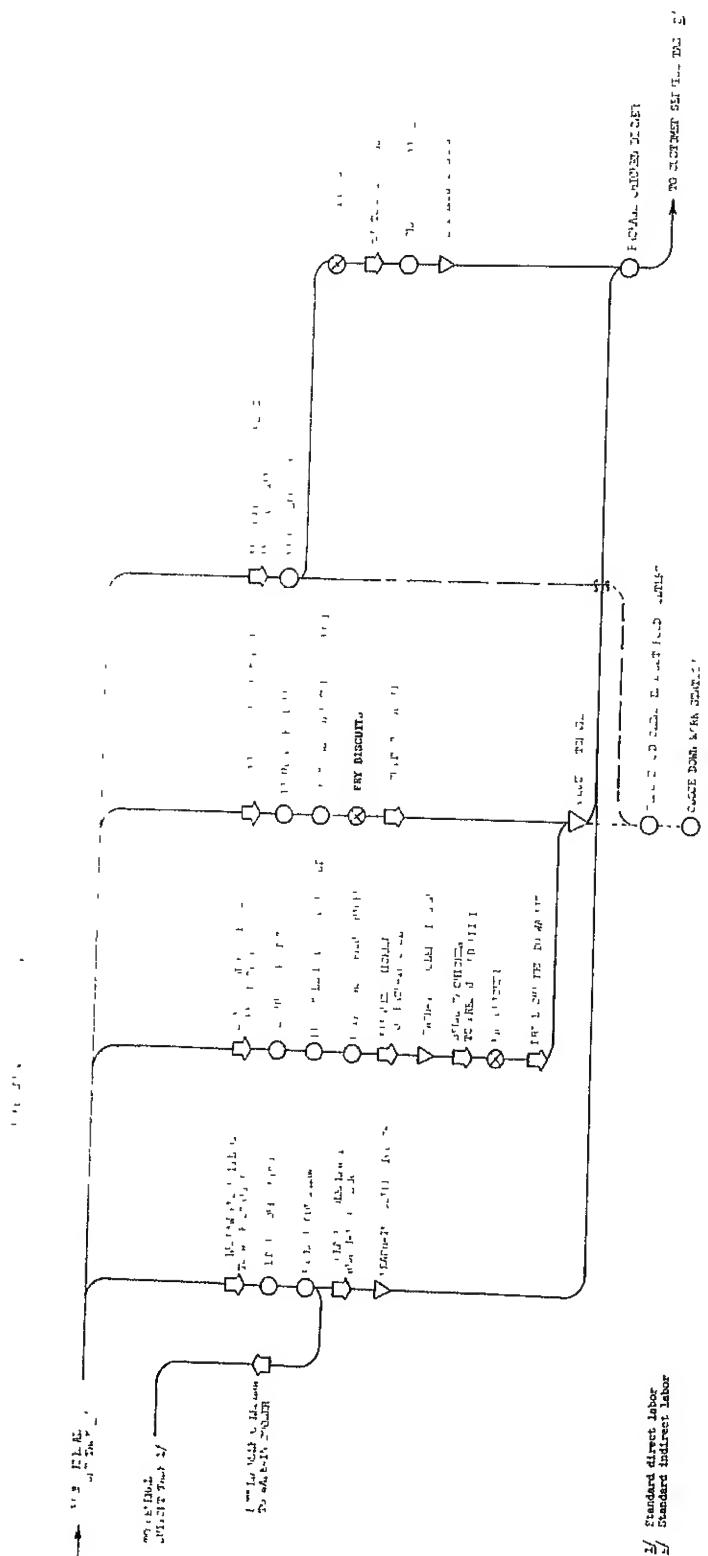


Figure 16.—Flow process chart for chicken dinners.

Figure 17 shows an employee packaging french fries. The coleslaw, chicken, biscuits, and french fries are packaged during the process task. Figure 18 shows an employee packaging a chicken dinner. All items for the customer's order are assembled and checked out during the customer service task. The standard productive capacity for this method is 72 fried-chicken dinners per hour.

The flow process chart for chicken family packs and buckets is comparable to that for chicken dinners, except that the work elements associated with coleslaw, biscuits, and french-fried potatoes have been deleted. The standard productive capacity for these methods is 45 family packs or 33 buckets per hour.

As shown in figure 19, chicken is breaded, fried, and placed in walk-in cooler storage during the preparation support task. The fried chicken for this item comes from amounts that have been overproduced for a prior meal period. It is now served cold. Biscuits for this

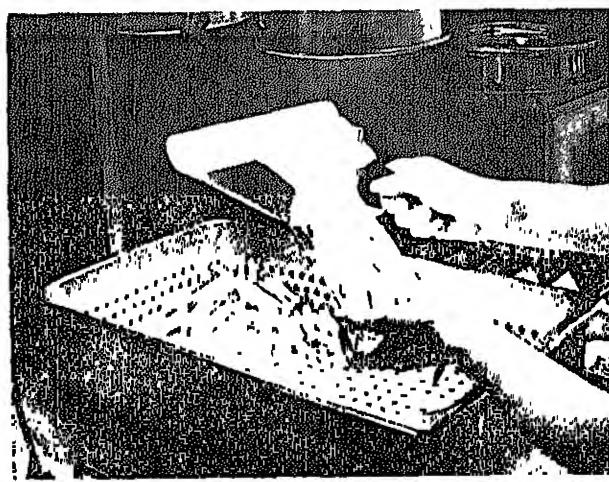


Figure 17.—Packaging french fries for temporary storage.



PN-3895

Figure 18.—Packaging a chicken dinner.

item are prepared before being packaged and displayed at the customer service counter.

The advantage of this production method is completing the majority of work during the preparation support task before the peak meal period. This feature expedites customer service, because possible customer delay that results from employees working during the process task has now been eliminated. The standard productive capacity per hour for this method is determined by the customer service task.

Table 10 shows the ratios of standard costs and revenue residuals to sales prices for the four chicken items. Ninety-four percent of the total chicken sales are derived from chicken dinners and chicken parts. These two items

TABLE 10.—*Ratios of standard costs and revenue residuals to sales prices for chicken orders*

Menu item	Material costs Percent	Direct labor costs Percent	Prime costs Percent	Product costs Percent	Revenue residuals Percent	Ratios of units sold Percent
Dinner .....	65.19	5.10	70.29	76.81	23.69	51.0
Family pack .....	81.10	5.59	86.69	89.64	10.36	2.8
Bucket .....	77.16	4.71	81.87	83.60	16.40	3.2
Parts .....	58.29	5.64	68.93	75.82	24.68	43.0

## PREPARATION SUPPORT TASK 1/

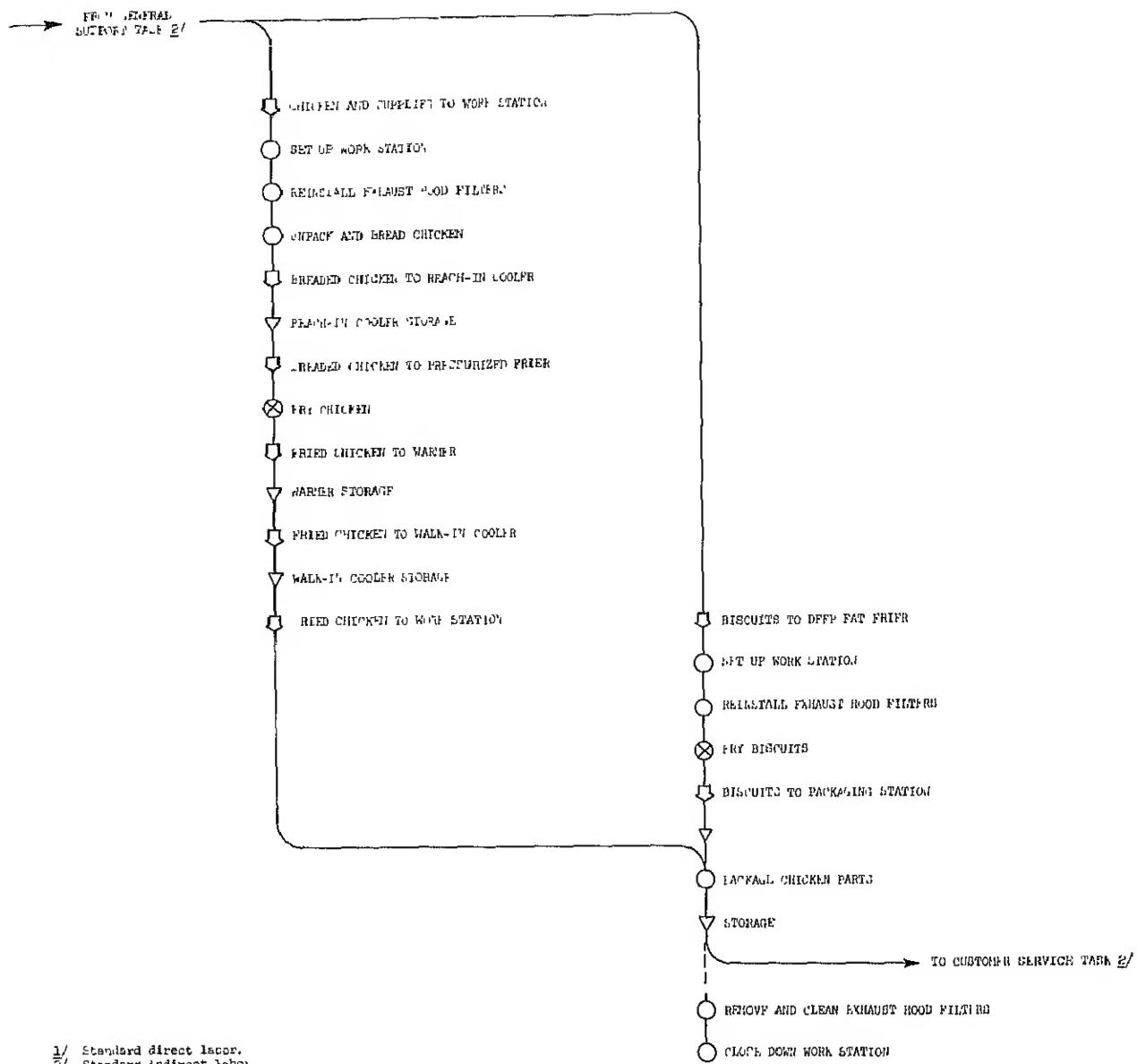


Figure 19.—Flow process chart for chicken parts.

have the lowest sales prices and yield more than 23 percent of revenue residual from the sales price.

### Submarine Sandwiches

The product costs and revenue residuals for five types of submarine sandwiches were developed during this research. The first two

types, large and small submarines, consist of a bun, coldcut salami, provolone cheese, hot and sweet peppers, onion, lettuce, tomato, and oil. The third type, ham submarine, consists of a bun, coldcut ham, hot and sweet peppers, onion, lettuce, tomato, and oil. The fourth and fifth types, large and small steak submarines, are comparable to the ham submarine, except that

## PREPARATION SUPPORT TASK 1/

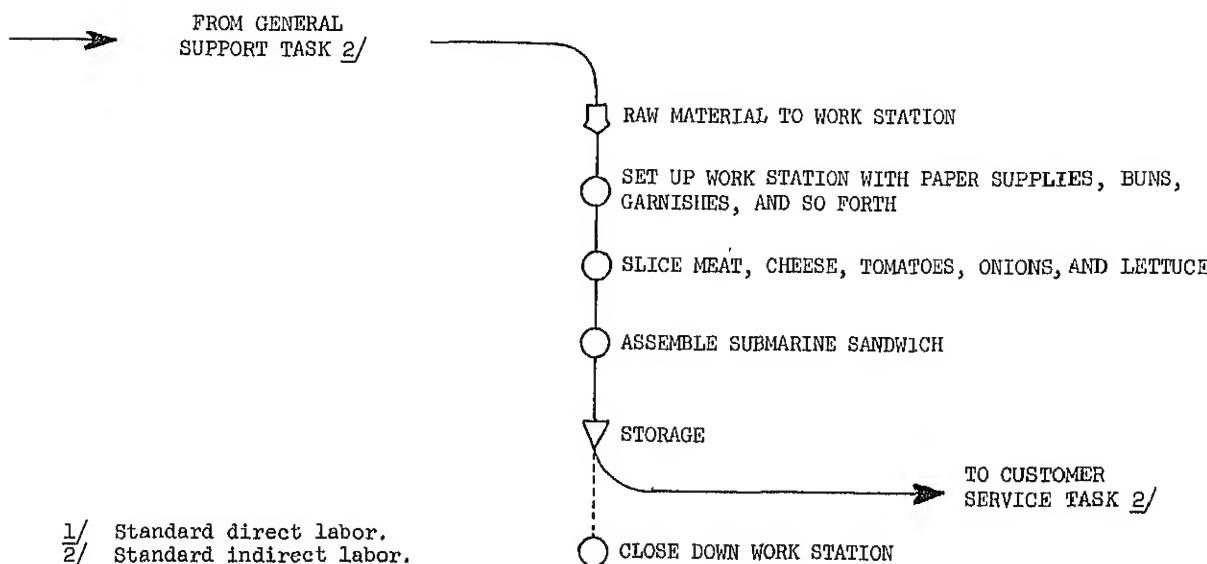


Figure 20.—Flow process chart for coldcut submarine sandwiches.

steak is substituted for ham. Buns, bulk luncheon meat, cheese, head lettuce, whole tomatoes, onions, portioned steaks, and prepared peppers are used to produce these items.

Figure 20 shows the flow process chart for coldcut-type (large, small, and ham) submarine sandwiches, and figure 21 shows the process chart for steak submarines. Both processes for the coldcut-type and steak submarines are comparable because the majority of work is performed in the preparation support task. As indicated in the charts, the process for steak submarines varies from that for coldcut submarines by the additional work incurred in cooking the steak and in cleaning exhaust hood

filters. The standard productive capacities for the described methods are determined by the customer service task.

Table 11 compares the ratios of standard costs and revenue residuals to sales prices for submarine sandwiches. As indicated, 46.8 percent of total sales are derived from large and small submarine sandwiches. The small steak submarine yields the largest ratio of revenue residual to sales price.

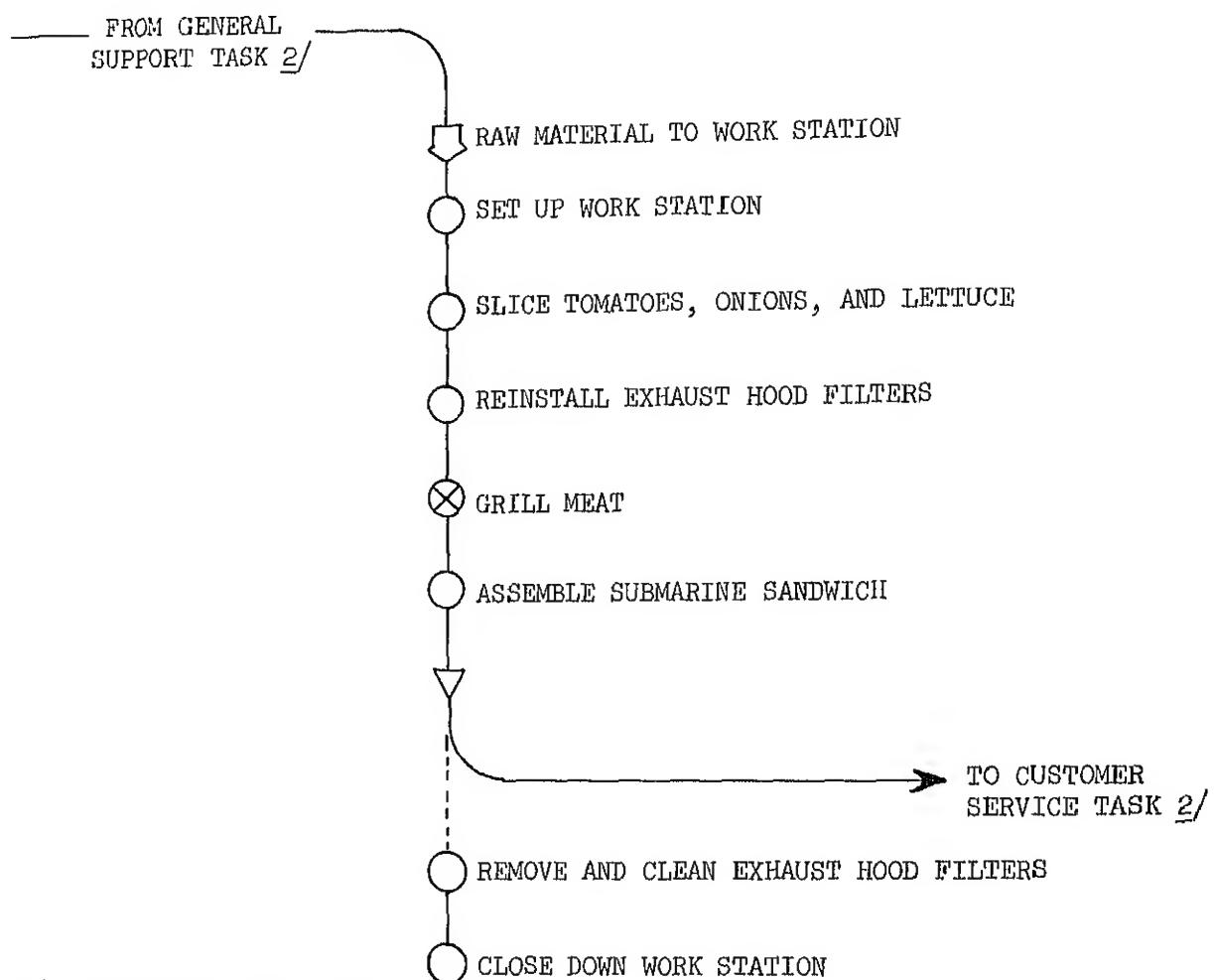
## Other Hot Food Items

The product costs and revenue residuals for five types of other hot food items were developed. These hot food items consist of hot

TABLE 11.—Ratios of standard costs and revenue residuals to sales prices for submarine sandwiches

Menu item	Material costs Percent	Direct labor costs Percent	Prime costs Percent	Product costs Percent	Revenue residuals Percent	Ratios of units sold Percent
Large -----	46.75	8.26	55.01	60.98	89.07	23.4
Small -----	37.87	8.17	46.04	53.46	46.54	23.4
Ham -----	41.25	7.38	48.68	56.06	43.94	18.0
Large steak -----	85.99	4.82	40.81	45.36	54.64	18.2
Small steak -----	33.02	5.38	38.40	44.32	55.68	22.0

## PREPARATION SUPPORT TASK 1/



1/ Standard direct labor.

2/ Standard indirect labor.

Figure 21.—Flow process chart for steak submarine sandwiches.

roast beef sandwiches, fish sandwiches, hotdog sandwiches, french-fried potatoes, and apple turnovers. The first item, hot roast beef sandwich, consists of a bun, sliced roast beef, and sauce. The second item, fish sandwich, consists of a bun, cheese, fish, and tartar sauce. The third item, hotdog sandwich, consists of a bun, frankfurter, mustard, chili sauce, and onions. The fourth item, french-fried potatoes, consists of one basic ingredient, potatoes. The fifth item, apple turnover, consists of apple filling encased in a pastry crust. Bulk precooked beef is used in the production of hot roast beef sandwiches. Breaded and portioned fish fillets,

sliced cheese, and tartar sauce are prepared for the production of fish sandwiches. Bulk onions and chili sauce are used in the production of hotdogs, and frozen french fries and apple turnovers come as prepared items.

Figure 22 shows the flow process chart for hot roast beef sandwiches. The chart shows beef sliced and placed in storage during the preparation support task. The portioned beef is reheated in a microwave oven, while the buns are toasted in a conveyor-type toaster. Figure 23 shows part of the hot roast beef sandwich work station. After the buns have emerged from the toaster, they are buttered

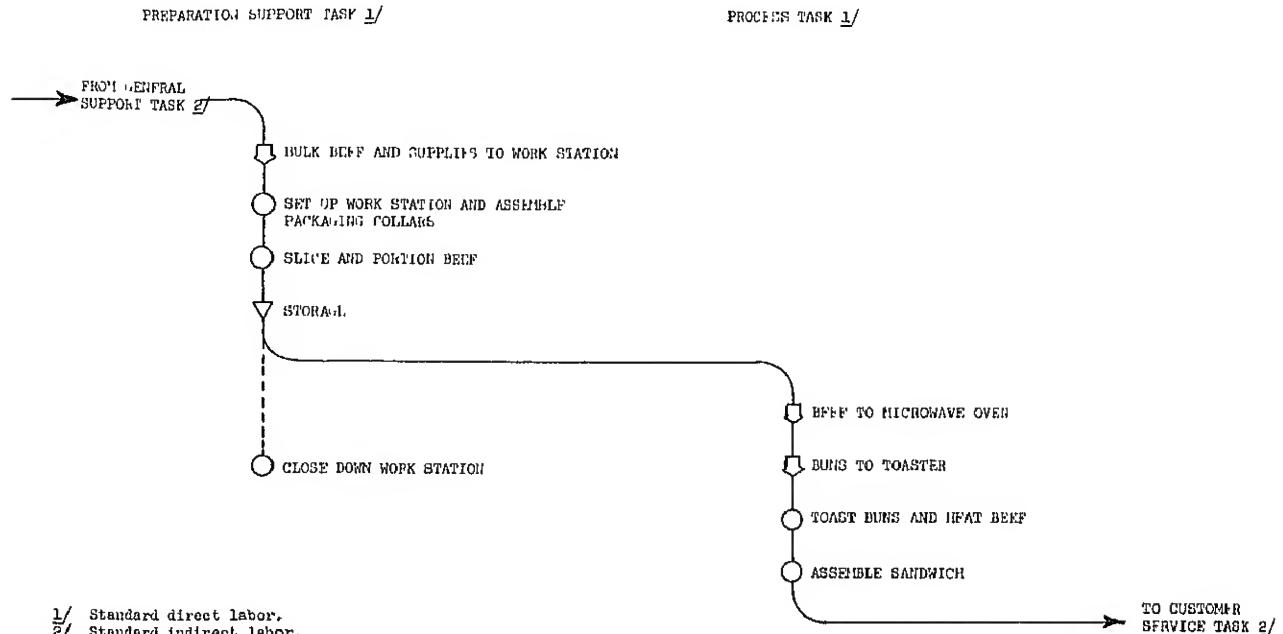


Figure 22.—Flow process chart for hot roast beef sandwiches.

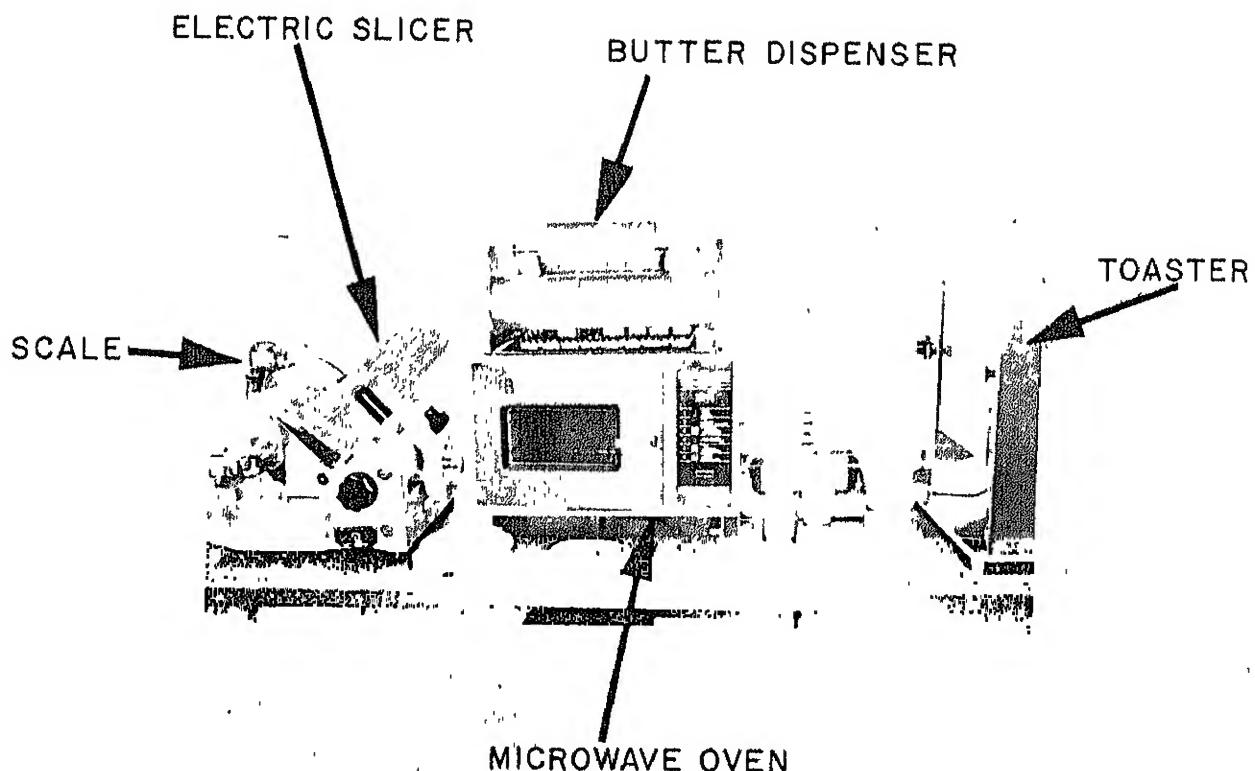


Figure 23.—Hot roast beef sandwich work station.

PN-8897

from a drum-type butter dispenser that is located on top of the microwave oven. The standard productive capacity for this method is 65 sandwiches per hour.

Figure 24 shows the flow process chart for fish sandwiches. While fish fillets are prefried during the preparation support task, final frying occurs during the process task. Buns with a slice of cheese inserted are toasted in a conveyor-type broiler. Equipment delay occurs while the broiler operator waits for the bun to emerge from the tunnel. Buns are removed individually from the conveyor to eliminate loss and to avoid poor appearance from overly melted cheese. The standard productive capacity for this method is 39 sandwiches per hour.

The production method for processing hotdog sandwiches is relatively simple. Buns and franks are unpackaged and placed in the steamer-type warmer, while chili sauce is placed in a warmer during the preparation support task. Hotdogs are assembled during the process task. The standard productive capacity for

this method is 164 hotdog sandwiches per hour.

The production method for french-fried potatoes is shown in the flow chart for chicken dinners in figure 17. The standard productive capacity for this method is 0.249 french-fried potato order per hour.<sup>3</sup>

The production method for apple turnovers is comparable to the process illustrated in figure 21 for steak submarine sandwiches, since no work elements are performed during the process task. Boxed turnovers are removed from the walk-in freezer, unboxed, fried in the deep-fat frier, individually packaged, and placed in a warmer. The work is performed during the preparation support task. The standard productive capacity per hour for apple turnovers is determined by the customer service task.

Table 12 shows the ratios of standard costs and revenue residuals to sales prices for other hot food items. As shown in table 12, 65.7

<sup>3</sup> Based on 0.401 man-hour per 100 orders to load, fry, unload, and bag.

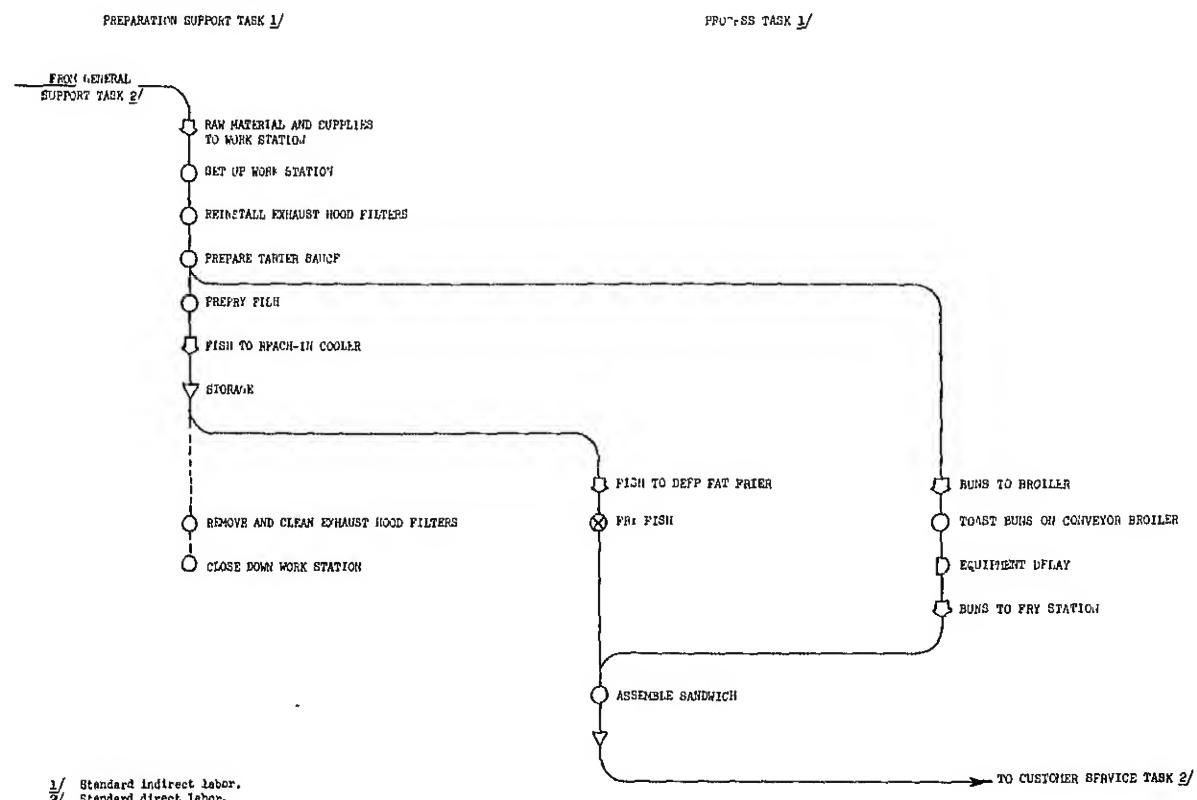


Figure 24.—Flow process chart for fish sandwiches.

TABLE 12.—*Ratios of standard costs and revenue residuals to sales prices for other hot food items*

Menu item	Material costs	Direct labor costs	Prime costs	Product costs	Revenue residuals	Ratios of units sold
	Percent	Percent	Percent	Percent	Percent	Percent
Roast beef sandwich	52.92	8.59	61.51	73.62	26.38	5.3
Fish sandwich	43.83	14.18	58.01	72.18	27.82	5.8
Hotdog sandwich	40.26	6.31	46.57	65.35	34.65	11.6
French-fried potatoes	28.01	3.70	31.71	59.19	40.81	65.7
Apple turnover	44.64	1.87	46.51	73.99	26.01	11.6

percent of total sales are derived from french-fried potatoes. French fries yield one of the largest ratios of revenue residual to sales price and also have a minimal direct labor-cost ratio to sales price of 1.87 percent.

### Beverages

Product costs and revenue residuals were developed for coffee, milk, milkshakes, orange drinks, hot chocolate, and carbonated drinks. Portioned coffee, chocolate packs, ½-pint containers of milk, prepared milkshake mix, orange drinks, and syrup are used to produce these items.

All the direct labor work elements for beverages are performed during the preparation support task. This work consists primarily of supplying the work station with paper products; either displaying the packaged milk in self-service cafeterias or placing it in a reach-in cooler for multiple-line service; setting up the hot chocolate, coffee, orange drink, and

carbonated beverage machines; and placing ice in storage bins for the orange drinks and carbonated beverages.

Figure 25 shows the types of coffeemaker and hot chocolate machines that were used. Figure 26 illustrates the equipment associated with milkshake production, and figure 27 pictures an employee drawing a carbonated beverage. The productive capacities per hour for beverages are determined by the customer service task.

Table 13 shows the ratios of standard costs and revenue residuals to sales prices for beverages. Sixty-seven percent of total beverage sales are derived from carbonated drinks. Carbonated drinks have the highest ratio of revenue to sales price of all the items produced and sold in a fast-food restaurant. They also offer a minimal direct labor-cost ratio to sales price of 0.51 percent. The table also indicates that a negative revenue residual results from the sale of milk.

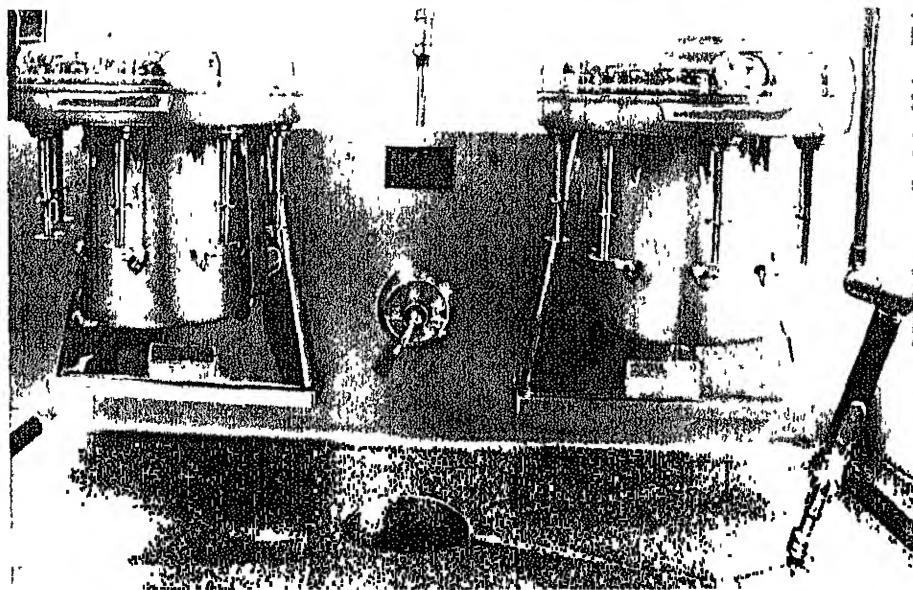
TABLE 13.—*Ratios of standard costs and revenue residuals to sales prices for beverages*

Menu item	Material costs	Direct labor costs	Prime costs	Product costs	Revenue residuals	Ratios of units sold
	Percent	Percent	Percent	Percent	Percent	Percent
Coffee	26.53	5.75	32.28	68.54	31.46	14.0
Milk	67.83	1.33	68.66	104.35	-4.85	5.0
Milkshake	26.01	6.24	32.25	75.28	24.72	9.0
Orange drink	22.10	2.64	24.74	49.48	50.52	2.0
Hot chocolate	41.85	.62	42.47	80.53	19.47	3.0
Carbonated drinks	19.54	.51	20.05	43.31	56.69	67.0



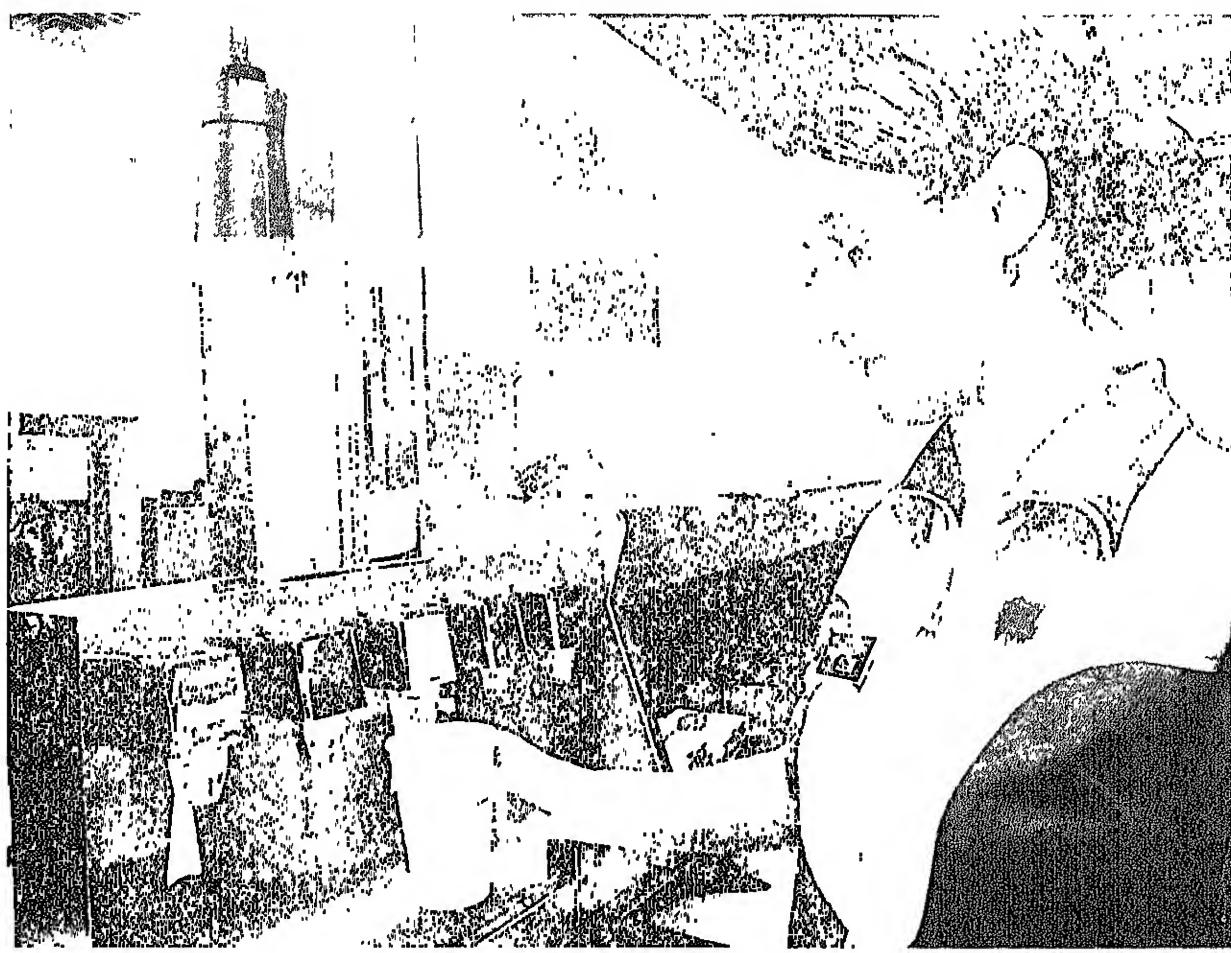
PN-8898

Figure 25.—Hot beverage equipment.



PN-8898

Figure 26.—Milkshake equipment.



PN-3900

Figure 27.—Drawing a carbonated beverage.

## STANDARD OPERATING BUDGETS AND LABOR SCHEDULES

The standard basic cost data developed in the previous section may be used to calculate a standard monthly operating budget and a daily labor schedule. The budgets and labor schedules in this section are not for a specific restaurant operation. The data are representative of the average restaurant that participated in this research and are based on the production methods described elsewhere in this report.

Appendix tables 55, 56, and 57 show the distribution of 3,096 menu items sold to 744 customers, the standard costs, the dollar sales, and the revenue residuals for each menu item

in restaurants classified as Groups I, II, and III.<sup>4</sup>

The data in the appendix are for an average day. The average number of items sold and the average customer count were determined by reading cash registers for 7 days. To develop an operating budget, the standard basic cost data for material, the process task, the preparation task, the product cost, and the sales price were multiplied by the specific number of menu items sold. The daily man-

<sup>4</sup> See table 1—Sales profile of fast-food restaurants by group.

hours for labor were determined by dividing the labor costs for the process task, the preparation task, the customer service task, and the general support task by the average hourly wage rate.

### Standard Operating Budgets

Table 14, which represents standard monthly operating budgets for restaurant groups, summarizes the data shown in appendix tables 55, 56, and 57 for 30 days. As indicated by the table, the menu mix for Group I restaurants generated \$690 more per month in revenue residuals and incurred \$3,030 more per month in product costs than did Group II restaurants. Group III restaurants generated \$930 more per month in revenue residuals and incurred \$120 less per month in product costs than did Group II restaurants.

Figure 28 graphically presents the relationship between revenue residuals and sales and between product costs and sales. The intersection of the revenue residual curves with the horizontal sales axis indicates the sales volume required to break even (sales - product costs = zero revenue residuals) for each restaurant group.

Solution of the revenue residual formulas for zero (0) results in the following monthly break-even sales volumes: Group I, \$9,353; Group II, \$8,525; and Group III, \$7,728. The origin points of the revenue residual and product cost curves show the fixed costs per month for each restaurant group: Group I, \$4,770; Group II, \$4,740; and Group III, \$4,320. Fixed costs consist of overhead plus general support-task labor costs. The rate of change for variable costs is indicated by the product cost curves. Variable product costs consist of material, the process task, the preparation support task, and the customer service-task labor.

### Labor Schedules

Table 15 summarizes the man-hours per day and per 100 customers for the preparation task, the process and customer service tasks, and the general support task based on the menu mix for each group. The data shown in table 15 were used to develop a theoretical labor schedule for each restaurant group for an average day's production resulting from sales to 744 customers. The labor schedule for each restaurant group is shown in tables 16, 17, and 18.

TABLE 14.—*Standard monthly operating budgets for restaurant groups*

Item	Group I	Group II	Group III
	Dollars	Dollars	Dollars
Sales .....	28,950.00	25,230.00	26,040.00
Material .....	12,150.00	9,030.00	9,480.00
Direct labor:			
Process task .....	780.00	1,110.00	840.00
Preparation support task .....	570.00	360.00	480.00
Total direct labor .....	1,350.00	1,470.00	1,320.00
Prime cost .....	18,500.00	10,500.00	10,800.00
Indirect labor:			
Customer service task .....	690.00	690.00	690.00
General support task .....	270.00	270.00	270.00
Total indirect labor .....	960.00	960.00	960.00
Total labor .....	2,810.00	2,430.00	2,280.00
Overhead .....	4,500.00	4,470.00	4,050.00
Total product cost .....	18,960.00	15,980.00	15,810.00
Revenue residual .....	9,990.00	9,800.00	10,280.00
Sales per man-hour .....	24.00	20.00	22.00
Check average .....	1.30	1.18	1.17

R = REVENUE RESIDUAL, S = SALES, C = PRODUCT COST

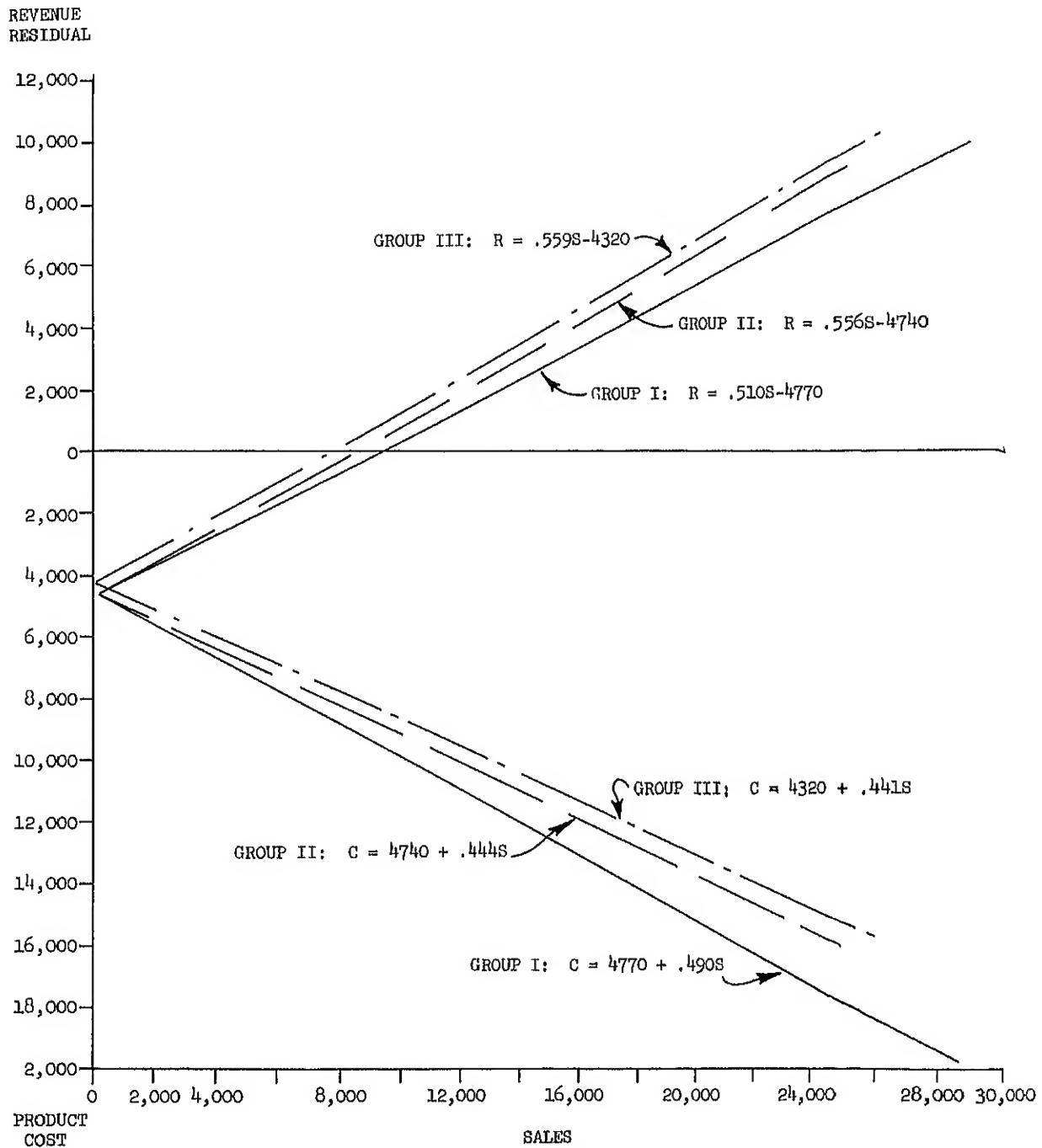


FIGURE 28.—Break-even and expense curves for restaurant groups.

TABLE 15.—*Man-hour requirements for restaurant groups*

Task	Group I		Group II		Group III	
	Time per day	Time per 100 customers	Time per day	Time per 100 customers	Time per day	Time per 100 customers
	<i>Man-hours</i>	<i>Man-hours</i>	<i>Man-hours</i>	<i>Man-hours</i>	<i>Man-hours</i>	<i>Man-hours</i>
Preparation . . . . .	10.0	1.3	6.8	0.8	8.4	1.1
Process and customer service . . . . .	25.0	3.4	30.9	4.2	26.4	3.6
Total variable labor . . . . .	35.0	4.7	37.2	5.0	34.8	4.7
General support (total fixed labor) . . . . .	4.7	--	4.7	--	4.7	--
Total labor . . . . .	39.7	--	41.9	--	39.5	--

Each schedule consists of two sections—theoretical and posted schedule. The theoretical schedule was developed on the basis that preparation taskwork for the peak meal periods of lunch (12 m. to 2 p.m.) and dinner (5 to 7 p.m.) will be performed before the meal period actually occurs, that the manager is able to predict the hourly customer count (or hourly sales volume divided by the check average) based on past experience, and that hourly employees cannot be scheduled for less than 4 hours of work.

The following eight-step procedure (tables 16-18) was used to develop the illustrated schedules:

1. The projected customer count (item 1) was posted for each business hour.
2. The preparation task man-hour requirements (item 2) and the process and customer service task (item 4) were calculated by multiplying the projected customer count by the respective task man-hours per 100 customers (from table 15).
3. The preparation task (item 3) was developed by adding the man-hour requirements shown in item 2 for the lunch period and the dinner period and then allocating the time to prelunch and predinner time periods.
4. The total variable labor schedule was determined by adding items 3 and 4.
5. The fixed general support-task labor of 4.7 man-hours (item 6) was allocated to end-of-the-day time periods to permit

closing down and to other time periods to balance the total theoretical schedule (item 7) with the total posted schedule (item 8).

6. The total theoretical schedule (item 7) was determined by adding items 5 and 6.
7. The total posted schedule (item 8) was developed by listing employees' names and then by drawing horizontal lines through the time period blocks in which the employees were scheduled to work. The number of lines in each time block was then added, and the number of hours was posted in the appropriate block.
8. The final step in the procedure was to balance as closely as possible the theoretical schedule hours and the posted schedule hours for each business hour, so that theoretical schedule hours would approximately equal posted schedule hours. This was accomplished either by shifting employee working hours in the posted schedule or by transferring work in the theoretical schedule for the preparation task, or general support task, or both to appropriate time periods.

The labor schedules shown in tables 16, 17, and 18 indicate that by dividing theoretical schedule hours by posted schedule hours, restaurant employees can achieve the following efficiency levels: Group I, 94.5 percent (39.7 divided by 42.0); Group II, 97.7 percent (42.0 divided by 43.0); and Group III, 94.8 percent (39.6 divided by 42.0).

TABLE 16.—Development of labor schedule for Group I restaurants

TABLE 17.—Development of labor schedule for Group II restaurants

TABLE 18.—Development of labor schedule for Group III restaurants

## OPPORTUNITIES FOR IMPROVING PRODUCTIVITY

The main opportunity to improve productivity and to reduce costs in fast-food restaurants lies in developing tighter schedules based on production requirements for employees who have been properly trained and motivated<sup>5</sup> to perform multiple duties such as grilling hamburgers, deep-frying fish and french fries, and filling customers' orders. The procedure for developing tighter labor schedules was presented in the preceding section. The level of labor utilization and potential annual savings from tighter scheduling are shown in table 19.

As shown in table 19, the average level of labor utilization for all restaurants studied was 53.8 percent. If the level of productivity were increased to 95.5 percent,<sup>6</sup> annual cost savings of \$25,639 per restaurant would result.<sup>7</sup>

Based on observations in the participating restaurants, considerable gains could be made in productivity by designing and implementing the following programs:

<sup>5</sup> Additional sources of information are Myers, M. S. *EVERY EMPLOYEE A MANAGER*. 233 pp., illus. McGraw-Hill Book Co., New York, 1970. Mager, R. F. *ANALYZING PERFORMANCE PROBLEMS*. 111 pp. Fearon Pub., Belmont, Calif., 1972. Herzberg, F., Mausner, B., and Snyderman, B. B. *THE MOTIVATION TO WORK*. 157 pp. John Wiley and Sons, Inc., New York, 1959.

<sup>6</sup> See table 19, footnote 1.

<sup>7</sup> The Agricultural Marketing Research Institute, Agricultural Research Service, is currently conducting research to develop a mathematical model to predict demand for specific menu items.

1. A professionally planned program for selecting, training, and motivating hourly and full-time salaried personnel.
2. A training program for managers and assistant managers in projecting anticipated production requirements and in developing corresponding labor schedules.
3. A procedure for providing both hourly and full-time salaried employees timely feedback information on the level of labor utilization and costs.

Food preparation and service in fast-food restaurants require employees with above average dexterity and good memories. Productivity could be improved by the selection and training of personnel who exhibit a natural talent in these traits. An employee who works in an informed and precise manner with a minimum of bungling and indecision will work at an optimum productivity level.

At the current volume of approximately \$7.6 billion in annual sales, the fast-food industry is ready for definite steps toward automation. Certain degrees of automation seem achievable in dispensing hamburger patties and buns onto conveyor broilers. Although these products now come to establishments packed in flat packages, they could be packed vertically, ready for insertion into cylinders for automatic dispensing onto a conveyor-broiler belt. Likewise, automatically dispensing condiments and wrapping sandwiches offer opportunities for reducing labor requirements. Additional research is re-

*TABLE 19.—Level of labor utilization and potential annual savings*

Restaurant group	Standard labor time <sup>8</sup>	Actual labor time <sup>9</sup>	Variance from standard	Variance from standard	Labor utilization
	Hours	Hours	Hours	Dollars <sup>10</sup>	Percent
I .....	15,246	29,766	14,520	28,227	51.2
II .....	15,609	27,225	11,616	22,582	57.3
III .....	15,246	28,677	13,431	26,110	58.2
Average .....	15,367	28,556	13,189	25,639	53.8

<sup>8</sup> Based on posted schedule hours shown in tables 16, 17, and 18 multiplied by 368 days per year. Average scheduling efficiency is 95.5 percent.

<sup>9</sup> Based on average payroll.

<sup>10</sup> Based on average hourly wage rate of \$1.944.

quired to determine if the increased costs for this type of automated equipment would be offset by reduced labor costs.

Although several food quality problems need to be overcome, labor requirements for producing fried-chicken orders could be reduced by purchasing breaded precooked chicken parts that could be reconstituted by using high-speed microwave ovens. This production method would eliminate the labor requirements to unpack and bread fresh poultry. Based on a volume of 155 chicken orders per day, annual labor savings of \$1,790 would result from the adoption of this production method. However, this labor savings would be offset by increased costs for equipment and food. Additional research is required to determine specific cost savings.

In the section on Indirect Labor Costs, it is shown that self-service cafeteria operations require approximately one-third less labor for the customer service task and have a potential of approximately three times the productive capacity (customers per hour) of either at-

tendant-service cafeteria or multiple-line service operations. The equipment for a self-service cafeteria operation is approximately \$2,600 more expensive than that for an attendant-service cafeteria and \$4,100 more expensive than that for multiple-line service. This increased cost for equipment would be recovered in less than 1 year, since a self-service cafeteria operation requires \$7,480 less for labor than does an attendant-service cafeteria and \$7,620 less than multiple-line service.

Additional research is required to determine the economic feasibility of self-service cafeteria service as opposed to other types. Factors such as the length of time required by the customer to make a selection, to place his order, to pay for it, and finally to receive change; the possible impact of suggestive selling by employees; and the design and placement of menu boards should be evaluated. These factors are common to all three types of customer service and could have a significant impact on savings.

## APPENDIX

### Exhibit A—Glossary of Terms

*Menu Item.*—An individual, finished food product such as a cheeseburger, hamburger, or orange drink for which a specific price is assessed.

*Order.*—The total menu items purchased by a customer for which one total charge is made.

*Work Element.*—A subdivision of a task composed of a sequence of several basic arm and body motions or a machine or process activity that is distinct, describable, and measurable. A work element has a clearly defined and observable starting and stopping point.<sup>1</sup>

*Unavoidable Delay.*—Unproductive time when the productive work of an employee is interrupted as a result of no inventory of available work.

*Recorded Time.*—Actual time value for

work element read from a stopwatch by an observer and recorded on a timestudy form.

*Pacerating Factor.*—An index applied by the timestudy analyst that compares the performance (speed or tempo) of the operator under observation with the observer's own concept of normal performance. Normal pace of 100 percent for this study was the effort required to walk at a speed of 3 miles per hour or to deal 52 cards into 4 equal stacks in the 4 corners of a 1-foot square in one-half minute.

*Normal Time.*—Either the product of recorded time multiplied by the pacerating factor or the summation of universal standard data time increments for basic hand, arm, body, and foot motions.

*Task.*—An identifiable segment of a process or a production system that consists of one or more work elements, all of which are required to produce an identifiable output that could be used, acted on, or advanced in production by an individual who may or may not be the performer.

---

<sup>1</sup> Adapted from American Society of Mechanical Engineers, INDUSTRIAL ENGINEERING TERMINOLOGY, New York, 1955.

### Exhibit B—Overhead and Equipment Costs

#### *Overhead Costs*

Annual depreciation cost (10 years)	-----	<sup>1</sup> \$8,200
Interest (10% × \$82,200 + 2)	-----	4,110
Net lease of land and improvement (45,000 sq ft × \$1 per sq ft × 18%)	-----	6,000
Taxes and other charges on building (3% × \$82,800)	-----	2,500
Repairs and maintenance	-----	800
Utilities and miscellaneous	-----	6,200
Corporate overhead	-----	10,000
Unit management	-----	<sup>2</sup> 8,700
Contingencies and reserves	-----	2,000
Total annual indirect cost for overhead and manage- ment	-----	48,510
Cost per 100 menu items (\$48,510 + 11,240)	-----	\$4.316

#### *Equipment Costs*

<i>Hamburger Sandwiches</i> (rotary broiler)	
Counter, table, and shelving	-----
Broiler	-----

See footnotes at end of tabulation.

*Equipment Costs—Continued*

Sauce warmer	\$50
Heat lamp	70
Sandwich bar and steamer	450
Total delivered	<u>2,670</u>
Installation	650
Total installed	<u>3,320</u>
Interest: 5-year depreciation: $\$3,320 \div 2 = \$1,660 \times 10\% = \$166 \times 5 \text{ years}$	880
Total costs	<u>4,150</u>
Annual depreciation: $\$4,150 + 5$	\$830
Annual maintenance and repairs	150
Annual cost of owning equipment	<u>980</u>
(veyor-belt broiler)	
Same as for rotary broiler, except add \$600 for additional cost of conveyor-belt broiler.	
Installed cost of rotary broiler station	3,320
Add for conveyor-belt broiler station	600
Total	<u>3,920</u>
Interest: 5-year depreciation: $\$3,920 \div 2 = \$1,960 \times 10\% = \$196 \times 5 \text{ years}$	980
Total costs	<u>4,900</u>
Annual depreciation: $\$4,900 + 5$	980
Annual maintenance and repairs	150
Annual cost of owning equipment	<u>1,130</u>
(grill)	
Same as for rotary broiler, except deduct \$1,000 from grill cost.	
Installed cost of rotary broiler station	3,320
Deduct for grill	1,000
Total	<u>2,320</u>
Interest: 5-year depreciation: $\$2,320 \div 2 = \$1,160 \times 10\% = \$116 \times 5 \text{ years}$	580
Total costs	<u>2,900</u>
Annual depreciation: $\$2,900 + 5$	580
Annual maintenance and repairs	100
Annual cost of owning equipment	<u>680</u>
Submarine Sandwiches	
Cold-sandwich bar installed	450.00
Interest: 5-year depreciation: $\$450 \div 2 = \$225 \times 10\% = \$22.50 \times 5 \text{ years}$	112.50
Total costs	<u>562.50</u>
Annual depreciation: $\$562.50 + 5$	112.50
Annual maintenance and repairs	30.00
Annual cost of owning equipment	<u>142.50</u>

*Equipment Costs—Continued**Roast Beef Sandwiches*

Radar range .....	\$900.00
Slicer .....	700.00
Bun toaster .....	550.00
Stainless steel counter and shelving .....	240.00
Total delivered .....	<u>2,390.00</u>
Installation .....	40.00
Total installed .....	<u>2,430.00</u>
Interest: 5-year depreciation: \$2,430 + 2 = \$1,215 × 10% = \$121.50 × 5 years .....	607.50
Total costs .....	<u>3,037.50</u>
Annual depreciation: \$3,037.50 + 5 .....	\$607.50
Annual maintenance and repairs .....	150.00
Annual cost of owning equipment .....	<u>757.50</u>

*Hotdogs*

Steamer .....	150.00
Stainless steel counter and shelving .....	240.00
Total installed .....	<u>390.00</u>
Interest: 5-year depreciation: \$390 + 2 = \$195 × 10% = \$19.50 × 5 years .....	97.50
Total costs .....	<u>487.50</u>
Annual depreciation: \$487.50 + 5 .....	97.50
Annual maintenance and repairs .....	15.00
Annual cost of owning equipment .....	<u>112.50</u>

*Chicken*

Table and shelving .....	240
Frier .....	2,000
Warmer .....	300
Total delivered .....	<u>2,540</u>
Installation .....	520
Total installed .....	<u>3,060</u>
Interest: 5-year depreciation: \$3,060 + 2 = \$1,530 × 10% = \$153 × 5 years .....	765
Total costs .....	<u>3,825</u>
Annual depreciation: \$3,825 + 5 .....	765
Annual maintenance and repairs .....	100
Annual cost of owning equipment .....	<u>865</u>

*French Fries, Fish Sandwiches,  
and Apple Turnovers*

Friers (2) .....	800.00
Stainless steel counter and shelving .....	400.00
Lamp warmer .....	30.00
Total delivered .....	<u>1,230.00</u>

*Equipment Costs—Continued*

Installation	\$300.00
Total installed	<u>1,530.00</u>
Interest: 5-year depreciation: $\$1,530 \div 2 = \$765 \times$	
10% = $\$76.50 \times 5 \text{ years}$	382.50
Total costs	<u>1,912.50</u>
Annual depreciation: $\$1,912.50 \div 5$	\$382.50
Annual maintenance and repairs	65.00
Annual cost of owning equipment	<u>447.50</u>

## Allocation:

Menu Item	Percent of sales	Allocated share of annual cost of owning equipment <sup>a</sup>
French fries	78	\$327
Fish sandwich	14	68
Apple turnovers	13	58
Total	100	<u>448</u>

*Coffee*

Machine (installed)	\$125.00
Interest: 5-year depreciation: $\$125 \div 2 = \$62.5 \times$	
10% = $\$6.25 \times 5 \text{ years}$	31.25
Total costs	<u>156.25</u>
Annual depreciation: $\$156.25 \div 5$	\$31.25
Annual maintenance and repairs	10.00
Annual cost of owning equipment	<u>41.25</u>

*Milkshake*

Machines (2)	5,600
Installation	300
Total installed	<u>5,900</u>
Interest: 5-year depreciation: $\$5,900 \div 2 = \$2,950 \times$	
10% = $\$295 \times 5 \text{ years}$	1,475
Total costs	<u>7,375</u>
Annual depreciation: $\$7,375 \div 5$	1,475
Annual maintenance and repairs	200
Annual cost of owning equipment	<u>1,675</u>

*Orange Drink*

Machine (installed)	250.00
Interest: 5-year depreciation: $\$250 \div 2 = \$125 \times$	
10% = $\$12.50 \times 5 \text{ years}$	62.50
Total costs	<u>312.50</u>
Annual depreciation: $\$312.50 \div 5$	62.50
Annual maintenance and repairs	20.00
Annual cost of owning equipment	<u>82.50</u>

See footnotes at end of tabulation.

*Equipment Costs—Continued**Hot Chocolate*

Machine (installed) .....	\$80
Interest: 5-year depreciation: $\$80 + 2 = \$40 \times 10\%$	
= $\$4 \times 5$ years .....	20
Total costs .....	<u>100</u>
Annual depreciation: $\$100 + 5$ .....	\$20
Annual maintenance and repairs .....	5
Annual cost of owning equipment .....	<u>25</u>

*Carbonated Drinks*

Carbonation unit .....	3,000.00
Installation .....	450.00
Total installed .....	<u>3,450.00</u>
Interest: 5-year depreciation: $\$3,450 + 2 = \$1,725 \times$	
10% = $\$172.50 \times 5$ years .....	862.50
Total costs .....	<u>4,312.50</u>
Annual depreciation: $\$4,312.50 + 5$ .....	862.50
Annual maintenance and repairs .....	200.00
Annual cost of owning equipment .....	<u>1,062.50</u>

\* Depreciation cost:

Item	Size	Unit cost	Total cost
	Sq ft	Dollars	Dollars
Building .....	3,200	20	64,000
Freezer .....	80	35	2,800
Cooler .....	100	30	3,000
Service counter .....	250	20	*4,400
Equipment .....	.....	--	8,000
Total .....	.....	--	82,200

\*Average of self-service, \$6,600; attendant service, \$4,000; and multiple-line service, \$2,500.

<sup>1</sup>  $\frac{1}{2}$  manager and  $\frac{1}{2}$  assistant manager. Balance charged as labor.

<sup>2</sup> Rounded.

<sup>3</sup> Based on Group I, rounded to total whole number.

TABLE 20.—*Standard prime costs for hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
	Quantity	costs			
Meat	Pound	.565	10.0	10.000	.5650
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.903	1.756
Total prime costs					12.204

TABLE 21.—*Standard prime costs for hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
	Quantity	costs			
Meat	Pound	.565	10.0	10.000	.5650
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.780	1.516
Total prime costs					11.964

TABLE 22.—*Standard prime costs for hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
	Quantity	costs			
Meat	Pound	.565	10.0	10.000	.5650
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.865	1.682
Total prime costs					12.130

TABLE 23.—*Standard prime costs for hamburger sandwiches with garnish—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	.565	10	10.000	.5650
Buns	Dozen	.310	12	8.333	2.583
Lettuce	Head	.270	18	5.556	1.500
Tomatoes	Pound	.200	20	5.000	1.000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	3.020	2,000	.050	.151
Subtotal					11.643
Loss	Percent			.010	.116
Total material costs					11.759
Direct labor costs	Man-hour	1.944		1.466	2.850
Total prime costs					14.609

TABLE 24.—*Standard prime costs for hamburger sandwiches with garnish—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	0.565	10	10.000	.5650
Buns	Dozen	.310	12	8.333	2.583
Lettuce	Head	.270	18	5.556	1.500
Tomatoes	Pound	.200	20	5.000	1.000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	3.020	2,000	.050	.151
Subtotal					11.648
Loss	Percent			.010	.116
Total material costs					11.759
Direct labor costs	Man-hour	1.944		1.493	2.903
Total prime costs					14.662

TABLE 25.—*Standard prime costs for hamburger sandwiches with garnish—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	.565	10	10.000	.5650
Buns	Dozen	.310	12	8.883	2.583
Lettuce	Head	.270	18	5.556	1.500
Tomatoes	Pound	.200	20	5.000	1.000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	3.020	2,000	.050	.151
Subtotal					11.643
Loss	Percent			.010	.116
Total material costs					11.759
Direct labor costs	Man-hour	1.944		1.486	2.889
Total prime costs					14.648

TABLE 26.—*Standard prime costs for cheeseburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	.565	10	10.000	.5650
Buns	Dozen	.310	12	8.883	2.583
Cheese	5-pound loaf	3.450	180	.556	1.918
Sauce	Gallon	2.460	128	.781	1.921
Wrap	Case	3.020	2,000	.050	.151
Subtotal					12.223
Loss	Percent			.010	.122
Total material costs					12.845
Direct labor costs	Man-hour	1.944		.933	1.814
Total prime costs					14.159

TABLE 27.—*Standard prime costs for cheeseburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Unit	Dollars	Number	Number	Dollars
Meat	Pound	.565	10	10,000	5,650
Buns	Dozen	.310	12	8,333	2,583
Cheese	5-pound loaf	3.450	180	.556	1,918
Sauce	Gallon	2.460	128	.781	1,921
Wrap	Case	8.020	2,000	.050	.151
Subtotal			---	---	12,228
Loss	Percent	---	---	.010	.122
Total material costs			---	---	12,345
Direct labor costs	Man-hour	1.944	---	.809	1,572
Total prime costs			---	---	13,917

TABLE 28.—*Standard prime costs for cheeseburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Unit	Dollars	Number	Number	Dollars
Meat	Pound	.565	10	10,000	5,650
Buns	Dozen	.310	12	8,333	2,583
Cheese	5-pound loaf	3.450	180	.556	1,918
Sauce	Gallon	2.460	128	.781	1,921
Wrap	Case	8.020	2,000	.050	.151
Subtotal			---	---	12,228
Loss	Percent	---	---	.010	.122
Total material costs			---	---	12,345
Direct labor costs	Man-hour	1.944	---	.988	1,920
Total prime costs			---	---	14,265

TABLE 29.—*Standard prime costs for double hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat .....	Pound .....	0.565	5.0	20.000	11.300
Buns .....	Dozen .....	.390	12.0	8.333	3.250
Sauce .....	Gallon .....	2.460	125.4	.797	1.961
Lettuce .....	Head .....	.270	18.0	5.556	1.500
Cheese .....	5-pound loaf .....	3.450	180.0	.556	1.918
Pickle .....	Gallon .....	1.450	138.0	.752	1.090
Catsup .....	115 ounces .....	1.425	345.0	.290	.413
Salt, pepper, and onions .....					.240
Wrap .....	Case .....	4.290	1,000.0	.100	.429
Subtotal .....					22.101
Loss .....	Percent .....			.010	.221
Total material costs .....					22.922
Direct labor costs .....	Man-hour .....	1.944		2.678	5.196
Total prime costs .....					27.518

TABLE 30.—*Standard prime costs for double hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat .....	Pound .....	0.565	5.0	20.000	11.300
Buns .....	Dozen .....	.390	12.0	8.333	3.250
Sauce .....	Gallon .....	2.460	125.4	.797	1.961
Lettuce .....	Head .....	.270	18.0	5.556	1.500
Cheese .....	5-pound loaf .....	3.450	180.0	.556	1.918
Pickle .....	Gallon .....	1.450	138.0	.752	1.090
Catsup .....	115 ounces .....	1.425	345.0	.290	.413
Salt, pepper, and onions .....					.240
Wrap .....	Case .....	4.290	1,000.0	.100	.429
Subtotal .....					22.101
Loss .....	Percent .....			.010	.221
Total material costs .....					22.322
Direct labor costs .....	Man-hour .....	1.944		2.389	4.644
Total prime costs .....					26.966

TABLE 31.—*Standard prime costs for double hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Pound	.565	5.0	20.000	11.300
Buns	Dozen	.390	12.0	8.333	3.250
Sauce	Gallon	2.460	125.4	.797	1.961
Lettuce	Head	.270	18.0	5.556	1.500
Cheese	5-pound loaf	3.450	180.0	.556	1.918
Pickle	Gallon	1.450	183.0	.752	1.090
Catsup	115 ounces	1.425	345.0	.290	.413
Salt, pepper, and onions					.240
Wrap	Case	4.290	1,000.0	.100	.420
Subtotal					22,101
Loss	Percent			.010	.221
Total material costs					22,822
Direct labor costs	Man-hour	1.944		1.976	8.841
Total prime costs					26.163

TABLE 32.—*Standard prime costs for large hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Pound	0.565	4	25.000	14.125
Buns	Dozen	.440	12	8.333	3.667
Pickle	Gallon	1.450	183	.752	1.090
Lettuce	Head	.270	14	7.143	1.929
Tomatoes	Pound	.200	10	10.000	2.000
Mayonnaise	Gallon	1.940	128	.781	1.515
Wrap	Case	4.290	1,000	.100	.420
Subtotal					24.755
Loss	Percent			.010	.248
Total material costs					25.003
Direct labor costs	Man-hour	1.944		3.432	6.672
Total prime costs					31.675

TABLE 33.—*Standard prime costs for large hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Pound	0.565	4	25.000	14.125
Buns	Dozen	.440	12	8.333	3.667
Pickle	Gallon	1.450	133	.752	1.090
Lettuce	Head	.270	14	7.143	1.929
Tomatoes	Pound	.200	10	10.000	2.000
Mayonnaise	Gallon	1.940	128	.781	1.515
Wrap	Case	4.290	1,000	.100	.429
Subtotal					24.755
Loss	Percent			.010	.248
Total material costs					25.003
Direct labor costs	Man-hour	1.944		2.150	4.180
Total prime costs					29.183

TABLE 34.—*Standard prime costs for large hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Pound	0.565	4	25.000	14.125
Buns	Dozen	.440	12	8.333	3.667
Pickle	Gallon	1.450	133	.752	1.090
Lettuce	Head	.270	14	7.143	1.929
Tomatoes	Pound	.200	10	10.000	2.000
Mayonnaise	Gallon	1.940	128	.781	1.515
Wrap	Case	4.290	1,000	.100	.429
Subtotal					24.755
Loss	Percent			.010	.248
Total material costs					25.003
Direct labor costs	Man-hour	1.944		1.551	3.015
Total prime costs					28.018

TABLE 35.—*Standard prime costs for chicken dinners—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Chicken <sup>1</sup>	3 pieces	.5289	1.00	100.000	52.890
Coleslaw	Pound	.2200	4.00	25.000	5.000
Biscuits <sup>2</sup>	Each	.0100	.50	200.000	2.000
Honey	Cup	.0200	1.00	100.000	2.000
French fries <sup>1</sup>	Pound	.2000	4.00	25.000	5.000
Oil	Gallon	2.6100	286.35	.349	.011
Wrap	Carton	11.3000	100.00	1.000	11.300
Cups	Pack	1.0800	100.00	1.000	1.080
Subtotal					80.181
Loss	Percent	---	---	.010	.807
Total material costs		---	---		80.988
Direct labor costs	Man-hour	1.9440	--	3.281	6.378
Total prime costs		---	---		87.366

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup>Processed in deep-fat frier.

<sup>1</sup>128 ounces/gallon ÷ (0.235 ounce per 4 ounces french fry portion + 0.212 ounce per biscuit).

TABLE 36.—*Standard prime costs for chicken family packs—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Chicken <sup>1</sup>	9 pieces	1.5867	1.00	100.000	158.670
Coleslaw	Pound	.2200	1.33	75.000	16.500
Biscuits <sup>2</sup>	Each	.0100	.17	600.000	6.000
Honey	Cup	.0200	.33	300.000	6.000
Oil for biscuits	Gallon	2.6100	100.63	.994	2.594
Container	1	.1500	1.00	100.000	15.000
Subtotal		---	---		204.764
Loss	Percent	---	---	.010	2.048
Total material costs		---	---		206.812
Direct labor costs	Man-hour	1.9440	--	7.326	14.242
Total prime costs		---	---		221.054

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup>Processed in deep-fat frier.

TABLE 37.—*Standard prime costs for chicken buckets—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Chicken <sup>1</sup>	18 pieces	Dollars	1	100,000	317.340
Container	1 bucket		15,0000	100,000	15,000
Subtotal			---	---	332,340
Loss	Percent		---	.010	3,323
Total material costs			---	---	335,663
Direct labor costs	Man-hour	1.9440	---	10,542	20,494
Total prime costs			---	---	356,157

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

TABLE 38.—*Standard prime costs for chicken parts—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Chicken <sup>1</sup>	2 pieces	Dollars	1.00	100,000	35,260
Biscuits <sup>2</sup>	Each		1.00	100,000	1,000
Oil for biscuits	Gallon		603.77	.166	.433
Wrap	Carton		1,200.00	.083	.396
Plates	Package		100.00	1,000	1,000
Subtotal			---	---	38,089
Loss	Percent		---	.010	.381
Total material costs			---	---	38,470
Direct labor costs	Man-hour	1.9440	---	1,916	3,725
Total prime costs			---	---	42,195

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup> Processed in deep-fat frier.

## OPPORTUNITIES FOR IMPROVING PRODUCTIVITY

The main opportunity to improve productivity and to reduce costs in fast-food restaurants lies in developing tighter schedules based on production requirements for employees who have been properly trained and motivated<sup>5</sup> to perform multiple duties such as grilling hamburgers, deep-frying fish and french fries, and filling customers' orders. The procedure for developing tighter labor schedules was presented in the preceding section. The level of labor utilization and potential annual savings from tighter scheduling are shown in table 19.

As shown in table 19, the average level of labor utilization for all restaurants studied was 53.8 percent. If the level of productivity were increased to 95.5 percent,<sup>6</sup> annual cost savings of \$25,639 per restaurant would result.<sup>7</sup>

Based on observations in the participating restaurants, considerable gains could be made in productivity by designing and implementing the following programs:

<sup>5</sup> Additional sources of information are Myers, M. S. *EVERY EMPLOYEE A MANAGER*. 233 pp., illus. McGraw-Hill Book Co., New York, 1970. Mager, R. F. *ANALYZING PERFORMANCE PROBLEMS*. 111 pp. Fearon Pub., Belmont, Calif. 1972. Herzberg, F., Mausner, B., and Snyderman, B. B. *THE MOTIVATION TO WORK*. 157 pp. John Wiley and Sons, Inc., New York. 1959.

<sup>6</sup> See table 19, footnote 1.

<sup>7</sup> The Agricultural Marketing Research Institute, Agricultural Research Service, is currently conducting research to develop a mathematical model to predict demand for specific menu items.

1. A professionally planned program for selecting, training, and motivating hourly and full-time salaried personnel.
2. A training program for managers and assistant managers in projecting anticipated production requirements and in developing corresponding labor schedules.
3. A procedure for providing both hourly and full-time salaried employees timely feedback information on the level of labor utilization and costs.

Food preparation and service in fast-food restaurants require employees with above average dexterity and good memories. Productivity could be improved by the selection and training of personnel who exhibit a natural talent in these traits. An employee who works in an informed and precise manner with a minimum of bungling and indecision will work at an optimum productivity level.

At the current volume of approximately \$7.6 billion in annual sales, the fast-food industry is ready for definite steps toward automation. Certain degrees of automation seem achievable in dispensing hamburger patties and buns onto conveyor broilers. Although these products now come to establishments packed in flat packages, they could be packed vertically, ready for insertion into cylinders for automatic dispensing onto a conveyor-broiler belt. Likewise, automatically dispensing condiments and wrapping sandwiches offer opportunities for reducing labor requirements. Additional research is re-

*TABLE 19.—Level of labor utilization and potential annual savings*

Restaurant group	Standard labor time <sup>8</sup>	Actual labor time <sup>9</sup>	Variance from standard	Variance from standard	Labor utilization
	Hours	Hours	Hours	Dollars <sup>10</sup>	Percent
I .....	15,246	29,766	14,520	28,227	51.2
II .....	15,609	27,225	11,616	22,582	57.3
III .....	15,246	28,677	13,431	26,110	58.2
Average .....	15,367	28,556	13,189	25,639	53.8

<sup>8</sup> Based on posted schedule hours shown in tables 16, 17, and 18 multiplied by 368 days per year. Average scheduling efficiency is 95.5 percent.

<sup>9</sup> Based on average payroll.

<sup>10</sup> Based on average hourly wage rate of \$1.944.

quired to determine if the increased costs for this type of automated equipment would be offset by reduced labor costs.

Although several food quality problems need to be overcome, labor requirements for producing fried-chicken orders could be reduced by purchasing breaded precooked chicken parts that could be reconstituted by using high-speed microwave ovens. This production method would eliminate the labor requirements to unpack and bread fresh poultry. Based on a volume of 155 chicken orders per day, annual labor savings of \$1,790 would result from the adoption of this production method. However, this labor savings would be offset by increased costs for equipment and food. Additional research is required to determine specific cost savings.

In the section on Indirect Labor Costs, it is shown that self-service cafeteria operations require approximately one-third less labor for the customer service task and have a potential of approximately three times the productive capacity (customers per hour) of either at-

tendant-service cafeteria or multiple-line service operations. The equipment for a self-service cafeteria operation is approximately \$2,600 more expensive than that for an attendant-service cafeteria and \$4,100 more expensive than that for multiple-line service. This increased cost for equipment would be recovered in less than 1 year, since a self-service cafeteria operation requires \$7,480 less for labor than does an attendant-service cafeteria and \$7,620 less than multiple-line service.

Additional research is required to determine the economic feasibility of self-service cafeteria service as opposed to other types. Factors such as the length of time required by the customer to make a selection, to place his order, to pay for it, and finally to receive change; the possible impact of suggestive selling by employees; and the design and placement of menu boards should be evaluated. These factors are common to all three types of customer service and could have a significant impact on savings.

## APPENDIX

### Exhibit A—Glossary of Terms

*Menu Item.*—An individual, finished food product such as a cheeseburger, hamburger, or orange drink for which a specific price is assessed.

*Order.*—The total menu items purchased by a customer for which one total charge is made.

*Work Element.*—A subdivision of a task composed of a sequence of several basic arm and body motions or a machine or process activity that is distinct, describable, and measurable. A work element has a clearly defined and observable starting and stopping point.<sup>1</sup>

*Unavoidable Delay.*—Unproductive time when the productive work of an employee is interrupted as a result of no inventory of available work.

*Recorded Time.*—Actual time value for

work element read from a stopwatch by an observer and recorded on a timestudy form.

*Pacerating Factor.*—An index applied by the timestudy analyst that compares the performance (speed or tempo) of the operator under observation with the observer's own concept of normal performance. Normal pace of 100 percent for this study was the effort required to walk at a speed of 3 miles per hour or to deal 52 cards into 4 equal stacks in the 4 corners of a 1-foot square in one-half minute.

*Normal Time.*—Either the product of recorded time multiplied by the pacerating factor or the summation of universal standard data time increments for basic hand, arm, body, and foot motions.

*Task.*—An identifiable segment of a process or a production system that consists of one or more work elements, all of which are required to produce an identifiable output that could be used, acted on, or advanced in production by an individual who may or may not be the performer.

---

<sup>1</sup> Adapted from American Society of Mechanical Engineers, INDUSTRIAL ENGINEERING TERMINOLOGY, New York, 1955.

### Exhibit B—Overhead and Equipment Costs

#### *Overhead Costs*

Annual depreciation cost (10 years)	-----	<sup>1</sup> \$8,200
Interest (10% × \$82,200 + 2)	-----	4,110
Net lease of land and improvement (45,000 sq ft × \$1 per sq ft × 18%)	-----	6,000
Taxes and other charges on building (3% × \$82,800)	-----	2,500
Repairs and maintenance	-----	800
Utilities and miscellaneous	-----	6,200
Corporate overhead	-----	10,000
Unit management	-----	<sup>2</sup> 8,700
Contingencies and reserves	-----	2,000
Total annual indirect cost for overhead and manage- ment	-----	48,510
Cost per 100 menu items (\$48,510 + 11,240)	-----	\$4.316

#### *Equipment Costs*

<i>Hamburger Sandwiches</i> (rotary broiler)	
Counter, table, and shelving	-----
Broiler	-----

See footnotes at end of tabulation.

*Equipment Costs—Continued*

Sauce warmer	\$50
Heat lamp	70
Sandwich bar and steamer	450
Total delivered	<u>2,670</u>
Installation	650
Total installed	<u>3,320</u>
Interest: 5-year depreciation: $\$3,320 \div 2 = \$1,660 \times 10\% = \$166 \times 5 \text{ years}$	880
Total costs	<u>4,150</u>
Annual depreciation: $\$4,150 + 5$	\$830
Annual maintenance and repairs	150
Annual cost of owning equipment	<u>980</u>
(veyor-belt broiler)	
Same as for rotary broiler, except add \$600 for additional cost of conveyor-belt broiler.	
Installed cost of rotary broiler station	3,320
Add for conveyor-belt broiler station	600
Total	<u>3,920</u>
Interest: 5-year depreciation: $\$3,920 \div 2 = \$1,960 \times 10\% = \$196 \times 5 \text{ years}$	980
Total costs	<u>4,900</u>
Annual depreciation: $\$4,900 + 5$	980
Annual maintenance and repairs	150
Annual cost of owning equipment	<u>1,130</u>
(grill)	
Same as for rotary broiler, except deduct \$1,000 from grill cost.	
Installed cost of rotary broiler station	3,320
Deduct for grill	1,000
Total	<u>2,320</u>
Interest: 5-year depreciation: $\$2,320 \div 2 = \$1,160 \times 10\% = \$116 \times 5 \text{ years}$	580
Total costs	<u>2,900</u>
Annual depreciation: $\$2,900 + 5$	580
Annual maintenance and repairs	100
Annual cost of owning equipment	<u>680</u>
Submarine Sandwiches	
Cold-sandwich bar installed	450.00
Interest: 5-year depreciation: $\$450 \div 2 = \$225 \times 10\% = \$22.50 \times 5 \text{ years}$	112.50
Total costs	<u>562.50</u>
Annual depreciation: $\$562.50 + 5$	112.50
Annual maintenance and repairs	30.00
Annual cost of owning equipment	<u>142.50</u>

*Equipment Costs—Continued**Roast Beef Sandwiches*

Radar range .....	\$900.00
Slicer .....	700.00
Bun toaster .....	550.00
Stainless steel counter and shelving .....	240.00
Total delivered .....	<u>2,390.00</u>
Installation .....	40.00
Total installed .....	<u>2,430.00</u>
Interest: 5-year depreciation: \$2,430 + 2 = \$1,215 × 10% = \$121.50 × 5 years .....	607.50
Total costs .....	<u>3,037.50</u>
Annual depreciation: \$3,037.50 + 5 .....	\$607.50
Annual maintenance and repairs .....	150.00
Annual cost of owning equipment .....	<u>757.50</u>

*Hotdogs*

Steamer .....	150.00
Stainless steel counter and shelving .....	240.00
Total installed .....	<u>390.00</u>
Interest: 5-year depreciation: \$390 + 2 = \$195 × 10% = \$19.50 × 5 years .....	97.50
Total costs .....	<u>487.50</u>
Annual depreciation: \$487.50 + 5 .....	97.50
Annual maintenance and repairs .....	15.00
Annual cost of owning equipment .....	<u>112.50</u>

*Chicken*

Table and shelving .....	240
Frier .....	2,000
Warmer .....	300
Total delivered .....	<u>2,540</u>
Installation .....	520
Total installed .....	<u>3,060</u>
Interest: 5-year depreciation: \$3,060 + 2 = \$1,530 × 10% = \$153 × 5 years .....	765
Total costs .....	<u>3,825</u>
Annual depreciation: \$3,825 + 5 .....	765
Annual maintenance and repairs .....	100
Annual cost of owning equipment .....	<u>865</u>

*French Fries, Fish Sandwiches,  
and Apple Turnovers*

Friers (2) .....	800.00
Stainless steel counter and shelving .....	400.00
Lamp warmer .....	30.00
Total delivered .....	<u>1,230.00</u>

*Equipment Costs—Continued*

Installation	\$300.00
Total installed	<u>1,530.00</u>
Interest: 5-year depreciation: $\$1,530 \div 2 = \$765 \times$	
10% = $\$76.50 \times 5 \text{ years}$	382.50
Total costs	<u>1,912.50</u>
Annual depreciation: $\$1,912.50 \div 5$	\$382.50
Annual maintenance and repairs	65.00
Annual cost of owning equipment	<u>447.50</u>

## Allocation:

Menu Item	Percent of sales	Allocated share of annual cost of owning equipment <sup>a</sup>
French fries	78	\$327
Fish sandwich	14	68
Apple turnovers	13	58
Total	100	<u>448</u>

*Coffee*

Machine (installed)	\$125.00
Interest: 5-year depreciation: $\$125 \div 2 = \$62.5 \times$	
10% = $\$6.25 \times 5 \text{ years}$	31.25
Total costs	<u>156.25</u>
Annual depreciation: $\$156.25 \div 5$	\$31.25
Annual maintenance and repairs	10.00
Annual cost of owning equipment	<u>41.25</u>

*Milkshake*

Machines (2)	5,600
Installation	300
Total installed	<u>5,900</u>
Interest: 5-year depreciation: $\$5,900 \div 2 = \$2,950 \times$	
10% = $\$295 \times 5 \text{ years}$	1,475
Total costs	<u>7,375</u>
Annual depreciation: $\$7,375 \div 5$	1,475
Annual maintenance and repairs	200
Annual cost of owning equipment	<u>1,675</u>

*Orange Drink*

Machine (installed)	250.00
Interest: 5-year depreciation: $\$250 \div 2 = \$125 \times$	
10% = $\$12.50 \times 5 \text{ years}$	62.50
Total costs	<u>312.50</u>
Annual depreciation: $\$312.50 \div 5$	62.50
Annual maintenance and repairs	20.00
Annual cost of owning equipment	<u>82.50</u>

See footnotes at end of tabulation.

*Equipment Costs—Continued**Hot Chocolate*

Machine (installed) .....	\$80
Interest: 5-year depreciation: $\$80 + 2 = \$40 \times 10\%$	
= $\$4 \times 5$ years .....	20
Total costs .....	<u>100</u>
Annual depreciation: $\$100 + 5$ .....	\$20
Annual maintenance and repairs .....	5
Annual cost of owning equipment .....	<u>25</u>

*Carbonated Drinks*

Carbonation unit .....	3,000.00
Installation .....	450.00
Total installed .....	<u>3,450.00</u>
Interest: 5-year depreciation: $\$3,450 + 2 = \$1,725 \times$	
10% = $\$172.50 \times 5$ years .....	862.50
Total costs .....	<u>4,312.50</u>
Annual depreciation: $\$4,312.50 + 5$ .....	862.50
Annual maintenance and repairs .....	200.00
Annual cost of owning equipment .....	<u>1,062.50</u>

' Depreciation cost:

Item	Size	Unit cost	Total cost
	Sq ft	Dollars	Dollars
Building .....	3,200	20	64,000
Freezer .....	80	35	2,800
Cooler .....	100	30	3,000
Service counter .....	250	20	*4,400
Equipment .....	.....	--	8,000
Total .....	.....	--	82,200

\*Average of self-service, \$6,600; attendant service, \$4,000; and multiple-line service, \$2,500.

'  $\frac{1}{2}$  manager and  $\frac{1}{2}$  assistant manager. Balance charged as labor.

' Rounded.

' Based on Group I, rounded to total whole number.

TABLE 20.—*Standard prime costs for hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	Dollars	Number	Number	Dollars
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.903	1.756
Total prime costs					12.204

TABLE 21.—*Standard prime costs for hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	Dollars	Number	Number	Dollars
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.780	1.516
Total prime costs					11.964

TABLE 22.—*Standard prime costs for hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	Dollars	Number	Number	Dollars
Buns	Dozen	.310	12.0	8.333	2.583
Sauce	Gallon	2.460	125.4	.797	1.961
Wrap	Case	3.020	2,000.0	.050	.151
Subtotal					10.345
Loss	Percent			.010	.103
Total material costs					10.448
Direct labor costs	Man-hour	1.944		.865	1.682
Total prime costs					12.130

TABLE 23.—*Standard prime costs for hamburger sandwiches with garnish—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	.565	10	10,000	5.650
Buns	Dozen	.310	12	8,333	2.583
Lettuce	Head	.270	18	5,556	1.500
Tomatoes	Pound	.200	20	5,000	1,000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	3.020	2,000	.050	.151
Subtotal					11.643
Loss	Percent			.010	.116
Total material costs					11.759
Direct labor costs	Man-hour	1.944		1,466	2.850
Total prime costs					14,609

TABLE 24.—*Standard prime costs for hamburger sandwiches with garnish—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	0.565	10	10,000	5.650
Buns	Dozen	.310	12	8,333	2.583
Lettuce	Head	.270	18	5,556	1.500
Tomatoes	Pound	.200	20	5,000	1,000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	3.020	2,000	.050	.151
Subtotal					11.648
Loss	Percent			.010	.116
Total material costs					11.759
Direct labor costs	Man-hour	1.944		1,493	2.903
Total prime costs					14,662

TABLE 23.—*Standard prime costs for hamburger sandwiches with garnish—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	.565	10	10,000	.650
Buns	Dozen	.310	12	8,333	2.583
Lettuce	Head	.270	18	5,556	1.500
Tomatoes	Pound	.200	20	5,000	1,000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	8,020	2,000	.050	.151
Subtotal					11,648
Loss	Percent			.010	.116
Total material costs					11,769
Direct labor costs	Man-hour	1.944		1,466	2,850
Total prime costs					14,609

TABLE 24.—*Standard prime costs for hamburger sandwiches with garnish—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Meat	Pound	0.565	10	10,000	.650
Buns	Dozen	.310	12	8,333	2.583
Lettuce	Head	.270	18	5,556	1.500
Tomatoes	Pound	.200	20	5,000	1,000
Mayonnaise	Gallon	1.940	256	.391	.759
Wrap	Case	8,020	2,000	.050	.151
Subtotal					11,648
Loss	Percent			.010	.116
Total material costs					11,769
Direct labor costs	Man-hour	1.944		1,493	2,903
Total prime costs					14,602

TABLE 25.—*Standard prime costs for hamburger sandwiches with garnish—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
		Dollars	Number	Number	Dollars
Meat . . . . .	Pound . . . . .	0.565	10	10,000	5.650
Buns . . . . .	Dozen . . . . .	.810	12	8,888	2.583
Lettuce . . . . .	Head . . . . .	.270	18	5.556	1.500
Tomatoes . . . . .	Pound . . . . .	.200	20	5,000	1.000
Mayonnaise . . . . .	Gallon . . . . .	1.940	256	.891	.759
Wrap . . . . .	Case . . . . .	3.020	2,000	.050	.151
Subtotal . . . . .					11.643
Loss . . . . .	Percent . . . . .	---		.010	.116
Total material costs . . . . .		---			11.759
Direct labor costs . . . . .	Man-hour . . . . .	1.944		1.486	2.889
Total prime costs . . . . .		---			14.648

TABLE 26.—*Standard prime costs for cheeseburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
		Dollars	Number	Number	Dollars
Meat . . . . .	Pound . . . . .	0.565	10	10,000	5.650
Buns . . . . .	Dozen . . . . .	.810	12	8,888	2.583
Cheese . . . . .	5-pound loaf . . . . .	8.450	180	.556	1.918
Sauce . . . . .	Gallon . . . . .	2.460	128	.781	1.921
Wrap . . . . .	Case . . . . .	3.020	2,000	.050	.151
Subtotal . . . . .		---			12.223
Loss . . . . .	Percent . . . . .	---		.010	.122
Total material costs . . . . .		---			12.345
Direct labor costs . . . . .	Man-hour . . . . .	1.944		.988	1.814
Total prime costs . . . . .		---			14.159

TABLE 27.—*Standard prime costs for cheeseburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	.0565	10	10,000	.650
Buns	Dozen	.310	12	8,333	2.583
Cheese	5-pound loaf	3.450	180	.556	1.918
Sauce	Gallon	2.460	128	.781	1.921
Wrap	Case	3.020	2,000	.050	.151
Subtotal					12.223
Loss	Percent			.010	.122
Total material costs					12.345
Direct labor costs	Man-hour	1.944		.809	1.572
Total prime costs					13.917

TABLE 28.—*Standard prime costs for cheeseburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	0.565	10	10,000	.650
Buns	Dozen	.310	12	8,333	2.583
Cheese	5-pound loaf	3.450	180	.556	1.918
Sauce	Gallon	2.460	128	.781	1.921
Wrap	Case	3.020	2,000	.050	.151
Subtotal					12.223
Loss	Percent			.010	.122
Total material costs					12.345
Direct labor costs	Man-hour	1.944		.988	1.020
Total prime costs					14.265

TABLE 29.—*Standard prime costs for double hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Unit	Dollars	Number	Number	Dollars
	Pound	.565	5.0	20,000	11.300
Buns	Dozen	.390	12.0	8,333	3.250
Sauce	Gallon	2.460	125.4	.797	1.961
Lettuce	Head	.270	18.0	5,556	1.500
Cheese	5-pound loaf	3.450	180.0	.556	1.918
Pickle	Gallon	1.450	133.0	.752	1.090
Catsup	115 ounces	1.425	345.0	.290	.413
Salt, pepper, and onions					.240
Wrap	Case	4.290	1,000.0	.100	.429
Subtotal					22.101
Loss	Percent			.010	.221
Total material costs					22.322
Direct labor costs	Man-hour	1.944		2.673	5.196
Total prime costs					27.518

TABLE 30.—*Standard prime costs for double hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Meat	Unit	Dollars	Number	Number	Dollars
	Pound	.565	5.0	20,000	11.300
Buns	Dozen	.390	12.0	8,333	3.250
Sauce	Gallon	2.460	125.4	.797	1.961
Lettuce	Head	.270	18.0	5,556	1.500
Cheese	5-pound loaf	3.450	180.0	.556	1.918
Pickle	Gallon	1.450	133.0	.752	1.090
Catsup	115 ounces	1.425	345.0	.290	.413
Salt, pepper, and onions					.240
Wrap	Case	4.290	1,000.0	.100	.429
Subtotal					22.101
Loss	Percent			.010	.221
Total material costs					22.322
Direct labor costs	Man-hour	1.944		2.389	4.644
Total prime costs					26.966

TABLE 31.—*Standard prime costs for double hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit	Dollars	Number	Dollars
Meat	Pound		0.565	5.0	20.000
Buns	Dozen		.390	12.0	8.333
Sauce	Gallon		2.460	125.4	.797
Lettuce	Head		.270	18.0	5.556
Cheese	5-pound loaf		3.450	180.0	.556
Pickle	Gallon		1.450	133.0	.752
Catsup	115 ounces		1.425	345.0	.290
Salt, pepper, and onions					.240
Wrap	Case		4.290	1,000.0	.100
Subtotal					22.101
Loss	Percent				.010
Total material costs					22.322
Direct labor costs	Man-hour		1.944		1.976
Total prime costs					26.163

TABLE 32.—*Standard prime costs for large hamburger sandwiches—rotary broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit	Dollars	Number	Dollars
Meat	Pound		0.565	4	25.000
Buns	Dozen		.440	12	8.333
Pickle	Gallon		1.450	133	.752
Lettuce	Head		.270	14	7.143
Tomatoes	Pound		.200	10	10.000
Mayonnaise	Gallon		1.940	128	.781
Wrap	Case		4.290	1,000	.100
Subtotal					24.755
Loss	Percent				.010
Total material costs					25.003
Direct labor costs	Man-hour		1.944		8.432
Total prime costs					33.675

TABLE 33.—*Standard prime costs for large hamburger sandwiches—conveyor-belt broiler*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	0.565	4	25,000	14.125
Buns	Dozen	.440	12	8,333	3.667
Pickle	Gallon	1.450	133	.752	1.090
Lettuce	Head	.270	14	7.143	1.929
Tomatoes	Pound	.200	10	10,000	2,000
Mayonnaise	Gallon	1.940	128	.781	1.515
Wrap	Case	4.290	1,000	.100	.429
Subtotal					24.755
Loss	Percent			.010	.248
Total material costs					25.003
Direct labor costs	Man-hour	1.944		2.150	4.180
Total prime costs					29.183

TABLE 34.—*Standard prime costs for large hamburger sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Meat	Pound	0.565	4	25,000	14.125
Buns	Dozen	.440	12	8,333	3.667
Pickle	Gallon	1.450	133	.752	1.090
Lettuce	Head	.270	14	7.143	1.929
Tomatoes	Pound	.200	10	10,000	2,000
Mayonnaise	Gallon	1.940	128	.781	1.515
Wrap	Case	4.290	1,000	.100	.429
Subtotal					24.755
Loss	Percent			.010	.248
Total material costs					25.003
Direct labor costs	Man-hour	1.944		1.551	3.015
Total prime costs					28.018

TABLE 35.—*Standard prime costs for chicken dinners—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Chicken <sup>1</sup>	3 pieces	.5289	1.00	100.000	52.890
Coleslaw	Pound	.2200	4.00	25.000	5.000
Biscuits <sup>2</sup>	Each	.0100	.50	200.000	2.000
Honey	Cup	.0200	1.00	100.000	2.000
French fries <sup>3</sup>	Pound	.2000	4.00	25.000	5.000
Oil	Gallon	2.6100	286.35	.349	.911
Wrap	Carton	11.3000	100.00	1.000	11.300
Cups	Pack	1.0800	100.00	1.000	1.080
Subtotal					80.181
Loss	Percent			.010	.807
Total material costs					80.988
Direct labor costs	Man-hour	1.9440		3.281	6.378
Total prime costs					87.366

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup>Processed in deep-fat frier.

<sup>3</sup>128 ounces/gallon ÷ (0.235 ounce per 4 ounces french fry portion + 0.212 ounce per biscuit).

TABLE 36.—*Standard prime costs for chicken family packs—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Chicken <sup>1</sup>	9 pieces	1.5867	1.00	100.000	158.670
Coleslaw	Pound	.2200	1.33	75.000	16.500
Biscuits <sup>2</sup>	Each	.0100	.17	600.000	6.000
Honey	Cup	.0200	.33	300.000	6.000
Oil for biscuits	Gallon	2.6100	100.63	.994	2.594
Container	1	.1500	1.00	100.000	15.000
Subtotal					204.764
Loss	Percent			.010	2.048
Total material costs					206.812
Direct labor costs	Man-hour	1.9440		7.826	14.242
Total prime costs					221.054

<sup>1</sup>\$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup>Processed in deep-fat frier.

TABLE 37.—*Standard prime costs for chicken buckets—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Chicken <sup>1</sup>	18 pieces	Dollars	Number	Number	Dollars
		3.1734	1	100.000	317.340
Container	1 bucket	15.0000	1	100.000	15.000
Subtotal			---	---	332.340
Loss	Percent	---	---	.010	3.323
Total material costs			---	---	335.663
Direct labor costs	Man-hour	1.9440	---	10.542	20.494
Total prime costs			---	---	356.157

<sup>1</sup> \$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

TABLE 38.—*Standard prime costs for chicken parts—pressure-type friers*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Chicken <sup>1</sup>	2 pieces	Dollars	Number	Number	Dollars
		0.8526	1.00	100.000	85.260
Biscuits <sup>2</sup>	Each	.0100	1.00	100.000	1.000
Oil for biscuits	Gallon	2.6100	603.77	.166	.438
Wrap	Carton	4.7700	1,200.00	.083	.396
Plates	Package	1.0000	100.00	1.000	1.000
Subtotal			---	---	38.089
Loss	Percent	---	---	.010	.381
Total material costs			---	---	38.470
Direct labor costs	Man-hour	1.9440	---	1.916	3.725
Total prime costs			---	---	42.195

<sup>1</sup> \$0.95 per bird ÷ 9 pieces = \$0.1056 per piece + \$0.0034 for breading and batter + \$0.0673 for oil = \$0.1763 per piece.

<sup>2</sup> Processed in deep-fat frier.

TABLE 39.—*Standard prime costs for large submarine sandwiches*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Onions	Pound	Dollars	24	4.167	.417
Lettuce	Head	.300	12	8.833	2.500
Tomatoes	Pound	.300	12	8.833	2.500
Italian salami	do	1.300	27	3.704	4.815
Wrap	Carton	4.530	1,000	.100	.458
Ham	Pound	1.290	24	4.167	5.875
Luncheon meat	do	.530	11	9.091	4.818
Cooked salami	do	.610	16	6.250	8.818
Provolone cheese	do	.640	7	14.286	9.143
Rolls	Piece	.080	1	100.000	8.000
Oil	Gallon	2.650	140	.714	1.892
Hot peppers	do	1.780	150	.667	1.187
Sweet peppers	do	1.920	210	.476	.914
Subtotal					45.827
Loss	Percent			.010	.458
Total material costs					46.285
Direct labor costs	Man-hour	1.944		4.206	8.176
Total prime costs					54.461

TABLE 40.—*Standard prime costs for small submarine sandwiches*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Onions	Pound	Dollars	32.00	8.125	.318
Lettuce	Head	.300	16.00	6.250	1.875
Tomatoes	Pound	.300	24.00	4.167	1.250
Italian salami	do	1.300	40.50	2.469	8.210
Wrap	Carton	4.530	1,350.00	.074	.395
Ham	Pound	1.290	48.00	2.088	2.687
Luncheon meat	do	.530	22.00	4.545	2.409
Cooked salami	do	.610	21.00	4.762	2.905
Provolone cheese	do	.640	14.00	7.148	4.572
Buns	Piece	.070	1.00	100.000	7.000
Oil	Gallon	2.650	180.00	.556	1.473
Hot peppers	do	1.780	200.00	.500	.890
Sweet peppers	do	1.920	275.00	.364	.699
Subtotal					29.618
Loss	Percent			.010	.296
Total material costs					29.914
Direct labor costs	Man-hour	1.944		3.822	6.458
Total prime costs					36.372

TABLE 41.—*Standard prime costs for ham submarine sandwiches*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Onions	Pound	.100	32	3.125	.318
Lettuce	Head	.300	16	6.250	1.875
Tomatoes	Pound	.300	24	4.167	1.250
Ham	do	1.290	7	14.286	18.429
Rolls	Piece	.070	1	100,000	7.000
Oil	Gallon	2.650	180	.556	1.473
Wrap	Carton	4.530	1,850	.074	.335
Hot peppers	Gallon	1.780	200	.500	.890
Sweet peppers	do	1.920	275	.364	.699
Subtotal					32.264
Loss	Percent			.010	.323
Total material costs					32.587
Direct labor costs	Man-hour	1.944		8,001	5.834
Total prime costs					38.421

TABLE 42.—*Standard prime costs for large steak submarine sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Steak	Unit	Dollars	Number	Number	Dollars
Onions	Pound	1.500	5	20,000	30,000
Lettuce	do	.100	24	4.167	.417
Tomatoes	Head	.800	12	8,333	2,500
Wrap	Pound	.300	12	8,333	2,500
Rolls	Carton	4.530	1,000	.100	.453
Hot peppers	Piece	.080	1	100,000	8,000
Sweet peppers	Gallon	1.780	150	.667	1.187
Subtotal	do	1.920	210	.476	.914
Loss	Percent			.010	.460
Total material costs					46.481
Direct labor costs	Man-hour	1.944		3,201	6.223
Total prime costs					52.654

TABLE 43.—*Standard prime costs for small steak submarine sandwiches—grill*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Steak	Pound	1.500	7.50	18.333	20.000
Onions	do	.100	32.00	3.125	.313
Lettuce	Head	.300	16.00	6.250	1.875
Tomatoes	Pound	.300	24.00	4.167	1.250
Wrap	Carton	4.580	1,350.00	.074	.335
Rolls	Piece	.070	1.00	100.000	7.000
Hot peppers	Gallon	1.780	200.00	.500	.890
Sweet peppers	do	1.920	275.00	.364	.699
Subtotal					32.362
Loss	Percent			.010	.324
Total material costs					32.686
Direct labor costs	Man-hour	1.944		2.740	5.327
Total prime costs					38.018

TABLE 44.—*Standard prime costs for hot roast beef sandwiches—microwave oven*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Roast beef	Pound	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	35.000
Buns	Dozen	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	3.000
Sauce	Gallon	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.820
Butter	Pound	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.990
Salt	do	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.150
Wrap	Case	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	.430
Subtotal					41.390
Loss	Percent				.414
Total material costs					41.804
Direct labor costs	Man-hour				6.789
Total prime cuts					48.593

<sup>1</sup> Based on information supplied by management.

TABLE 45.—*Standard prime costs for fish sandwiches—deep-fat frier*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Buns	Dozen	.310	12.00	8.333	2.583
Cheese	5-pound loaf	3.450	180.00	.556	1.918
Fish	Box	3.520	32.00	3.125	11.000
Tartar sauce	1 1/2 gallon	3.380	384.00	.260	.879
Cooking oil	Gallon	2.610	375.55	.266	.694
Wrap	Case	1.420	500.00	.200	.284
Subtotal					17.358
Loss	Percent			.010	.174
Total material costs					17.532
Direct labor costs	Man-hour	1.944		8.917	5.670
Total prime costs					23.202

TABLE 46.—*Standard prime costs for hotdog sandwiches—steam-type warmer*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
Buns	Dozen	.370	12.00	8.333	3.088
Franks	Pound	.560	10.00	10.000	5.600
Mustard	Gallon	.720	512.00	.195	.140
Chili sauce	do	3.650	170.66	.586	2.189
Onions	Pound	.200	28.09	3.560	.712
Wrap	Case	1.420	500.00	.200	.284
Subtotal					11.958
Loss	Percent			.010	.120
Total material costs					12.078
Direct labor costs	Man-hour	1.944		.973	1.892
Total prime costs					13.970

TABLE 47.—*Standard prime costs for french-fried potatoes—deep-fat frier*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
French fries	Pound	.200	4.00	25.000	5.000
Oil	Gallon	2.610	544.68	.184	.480
Wrap	Case	2.010	3,000.00	.033	.066
Subtotal					5.546
Loss	Percent			.010	.055
Total material costs					5.601
Direct labor costs	Man-hour	1.944		.380	.739
Total prime costs					6.840

TABLE 48.—*Standard prime costs for apple turnovers—deep-fat frier*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Oil	Gallon	2.610	192	0.521	1.360
Wrap	Carton	4.770	1,000	.100	.477
Apple turnovers	Case	5.760	96	1.042	6.002
Plates	Package	1.000	100	1.000	1.000
Subtotal					8.830
Loss	Percent			.010	.088
Total material costs					8.927
Direct labor costs	Man-hour	1.944		.192	.373
Total prime costs					9.300

TABLE 49.—*Standard prime costs for coffee—pour-o-matic*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Coffee	Pound	1.03	48	2.083	2.145
Cream	½ gallon	.84	128	.781	.656
Cups	Package	11.40	1,000	.100	1.140
Subtotal					8.941
Loss	Percent			.010	.089
Total material costs					8.980
Direct labor costs	Man-hour	1.944		.444	.868
Total prime costs					4.848

TABLE 50.—*Standard prime costs for milk (in cartons)*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit			
Milk	½ pint	Unit	Dollars	Number	Dollars
			0.100	1	10.000
Subtotal					10.000
Loss		Percent			.100
Total material costs					10.100
Direct labor costs	Man-hour		1.944		.200
Total prime costs					10.300

TABLE 51.—*Standard prime costs for milkshake—machine*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit	Quantity costs		
Chocolate milkshake	2 gallons	Unit	Dollars	Number	Dollars
			1.160	21.83	4.688
Small cups	Package			1,000.00	.100
Subtotal					6.438
Loss		Percent			.010
Total material costs					6.502
Direct labor costs	Man-hour		1.944		.161
Total prime costs					8.063

TABLE 52.—*Standard prime costs for orange drinks—jet spray*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Unit	Quantity costs		
Sirup	6 gallons	Unit	Dollars	Number	Dollars
			1.900	48	2.083
Ice	100 pounds			820	.313
Cups	Package			25	4.000
Subtotal					5.471
Loss		Percent			.010
Total material costs					5.526
Direct labor costs	Man-hour		1.944		.661
Total prime costs					6.187

TABLE 53.—*Standard prime costs for hot chocolate—hot chocolate dispenser*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Hot chocolate . . . . .	2 pounds . . . . .	1.220 . . . . .	24.04 . . . . .	4,160 . . . . .	5.075 . . . . .
Cups . . . . .	Package . . . . .	11.400 . . . . .	1,000.00 . . . . .	.100 . . . . .	1.140 . . . . .
Subtotal . . . . .			— . . . . .	— . . . . .	6.215 . . . . .
Loss . . . . .	Percent . . . . .		— . . . . .	.010 . . . . .	.062 . . . . .
Total material costs . . . . .			— . . . . .		6.277 . . . . .
Direct labor costs . . . . .	Man-hour . . . . .	1.944 . . . . .	— . . . . .	.048 . . . . .	.093 . . . . .
Total prime costs . . . . .			— . . . . .	— . . . . .	6.370 . . . . .

TABLE 54.—*Standard prime costs for carbonated drinks (16-ounce)—carbonated-drink dispenser*

Item	Basic unit		Servings per basic unit	Basic units per 100 servings	Costs per 100 servings
	Quantity description	Quantity costs			
	Unit	Dollars	Number	Number	Dollars
Sirup . . . . .	.30 gallons . . . . .	11.25 . . . . .	349.09 . . . . .	0.286 . . . . .	8.218 . . . . .
Ice . . . . .	100 pounds . . . . .	1.00 . . . . .	320.00 . . . . .	.313 . . . . .	.313 . . . . .
Cups . . . . .	Package . . . . .	.30 . . . . .	25.00 . . . . .	4.000 . . . . .	1.200 . . . . .
Carbon dioxide . . . . .	Cylinder . . . . .	7.50 . . . . .	7,000.00 . . . . .	.014 . . . . .	.105 . . . . .
Subtotal . . . . .			— . . . . .	— . . . . .	4.896 . . . . .
Loss . . . . .	Percent . . . . .	— . . . . .	— . . . . .	.010 . . . . .	.048 . . . . .
Total material costs . . . . .		— . . . . .	— . . . . .	— . . . . .	4.884 . . . . .
Direct labor costs . . . . .	Man-hour . . . . .	1.944 . . . . .	— . . . . .	.066 . . . . .	.128 . . . . .
Total prime costs . . . . .		— . . . . .	— . . . . .	— . . . . .	5.012 . . . . .

TABLE 55.—Standard costs, sales, and revenue residuals for Group I fast-food restaurants using conveyor-belt broilers during an average day

Item	Items sold	Ratio of items sold	Percent	Standard material costs	Standard direct labor costs		Standard product costs <sup>1</sup>	Sales	Revenue residuals
					Dollars	Dollars			
Hamburger	525	17.0	54.852	7.214	0.746	62.812	92.516	131.250	38.734
Hamburger with garnish	62	2.0	7.291	1.252	.547	9.090	12.598	21.700	9.102
Cheeseburger	186	6.0	22.962	2.552	.372	25.886	36.410	55.800	19.390
Large hamburger	124	4.0	31.004	2.375	2.809	36.188	43.203	68.200	24.997
Total hamburgers	897	29.0	116.109	13.393	4.474	133.976	184.727	276.950	92.223
Chicken dinner	62	2.0	50.523	1.655	2.900	54.478	59.137	77.500	18.363
Chicken family pack	15	.5	31.022	.647	1.489	33.158	34.286	38.250	3.964
Chicken bucket	15	.5	50.349	.869	2.205	53.423	54.551	65.250	10.699
Chicken parts	63	2.0	24.236	---	2.347	26.583	31.318	41.580	10.262
Total chicken	155	5.0	156.130	3.171	8.311	167.642	179.292	222.580	43.288
Fish sandwich	62	2.0	10.870	3.030	.485	14.385	17.899	24.800	6.901
Hotdog sandwich	155	5.0	18.721	1.832	1.101	21.654	30.389	46.500	16.111
French-fried potatoes	681	22.0	38.143	4.331	.701	43.175	80.617	136.200	55.583
Apple turnover	124	4.0	11.069	---	.463	11.532	18.350	24.800	6.450
Total other items	1,022	33.0	78.803	9.193	2.750	90.746	147.255	232.300	85.045
Coffee	142	4.6	5.652	---	1.225	6.877	14.599	21.300	6.701
Milk	53	1.7	5.353	---	.106	5.459	8.296	7.950	-.346
Milkshake	93	3.0	6.047	---	1.452	7.499	17.502	23.250	5.748
Orange drink	22	.7	1.216	---	.145	1.361	2.721	5.500	2.779
Hot chocolate	31	1.0	1.946	---	.029	1.975	3.745	4.650	.905
Carbonated drink	681	22.0	33.260	---	.372	34.132	73.732	170.250	96.518
Total beverages	1,022	33.0	53.474	---	3.829	57.303	120.595	232.900	112.305
Total all items	3,096	100.0	404.516	25.757	19.394	449.667	631.869	964.730	332.861

<sup>1</sup> Overhead = total standard product costs — total standard prime costs — customer service task costs — general support task costs = \$631.869 — \$449.667 — (\$0.740 per 100 items × 3,096 items) — (\$0.297 per 100 items × 3,096 items) = \$182.202 — \$22.910 — \$9.195 = \$150.097.

TABLE 56.—*Standard costs, sales, and revenue residuals for Group II fast-food restaurants using rotary-conveyor broilers during an average day*

Item	Items sold	Ratio of items sold	Standard material costs	Standard direct labor costs			Standard prime costs <sup>a</sup>	Standard product costs <sup>a</sup>	Sales	Revenue residuals
				Number	Percent	Dollars	Dollars	Process task	Preparation task	
Hamburger	464	15.0	48.479	7.489	0.659	56.627	82.694	116.000	116.000	33.306
Cheeseburger	310	10.0	38.270	5.003	.620	43.893	61.309	93.000	93.000	31.691
Double hamburger	248	8.0	55.359	10.379	2.507	68.245	82.177	124.000	124.000	41.823
Total hamburgers	1,022	33.0	142.108	22.871	3.786	168.765	226.180	383.000	383.000	106.820
Roast beef sandwich	62	2.0	25.918	1.835	2.375	30.128	36.057	48.980	48.980	12.923
Fish sandwich	155	5.0	27.175	7.575	1.214	35.964	44.749	62.000	62.000	17.251
French fries	773	25.0	43.296	4.916	.796	49.008	91.508	154.600	154.600	63.092
Apple turnover	155	5.0	13.837	---	.578	14.415	22.937	31.000	31.000	8.063
Total other items	1,145	37.0	110.226	14.326	4.963	129.515	195.251	296.580	296.580	101.329
Coffee	130	4.2	5.174	---	1.122	6.296	13.365	19.500	19.500	6.135
Milk	48	1.6	4.848	---	.996	4.944	7.470	7.200	7.200	-270
Milkshake	84	2.7	5.462	---	1.311	6.773	15.808	21.000	21.000	5.192
Orange drink	20	.6	1.105	---	.132	1.237	2.474	5.000	5.000	2.526
Hot chocolate	28	.9	1.758	---	.026	1.784	3.382	4.200	4.200	.818
Carbonated drink	619	20.0	30.232	---	.792	31.024	67.019	154.750	154.750	87.731
Total all beverages	929	30.0	48.579	---	3.479	52.058	109.518	211.650	211.650	102.132
Total all items	3,096	100.0	300.913	37.197	12.228	350.338	530.949	841.230	841.230	310.281

<sup>a</sup> Overhead = total standard product costs — total standard prime costs — customer service task costs — general support task costs = \$530.949  
— \$350.338 — (\$0.740 per 100 items × 3,096 items) — (\$0.297 per 100 items × 3,096 items) = \$180.611 — \$22.910 — \$9.195 = \$148.506.

TABLE 57.—Standard costs, sales, and revenue residuals for Group III fast-food restaurants using grills during an average day

Item	Items sold	Ratio of items sold	Percent	Standard material costs	Standard direct labor costs		Standard prime costs <sup>1</sup>	Standard product costs <sup>1</sup>	Sales	Revenue residuals
					Dollars	Dollars	Preparation task	Process task		
Hamburger	630	22.0	71.046	10.472	0.966	82.484	120.136	170.000	49.864	
Cheeseburger	248	8.0	30.616	4.266	.496	35.378	49.109	74.400	25.291	
Double hamburger	155	5.0	43.915	4.387	1.567	49.869	49.135	77.500	28.365	
Large hamburger	93	3.0	23.253	1.988	.816	26.057	31.206	51.150	19.944	
Total hamburgers	1,176	38.0	168.830	21.113	3.845	193.788	249.586	373.050	123.464	
Large submarine	22	.7	10.183	—	—	1.799	11.982	13.272	21.780	8.508
Small submarine	22	.7	6.581	—	—	1.421	8.002	9.292	17.380	8.088
Ham submarine	12	.4	3.910	—	—	.700	4.610	5.314	9.480	4.166
Large steak submarine	15	.5	6.965	—	—	.933	7.898	8.778	19.350	10.572
Small steak submarine	22	.7	7.191	—	—	1.172	8.363	9.653	21.780	12.127
Total submarines	93	3.0	34.830	—	—	6.025	40.855	46.309	89.770	43.461
Fish sandwich	31	1.0	5.435	1.515	.243	7.193	8.950	12.400	3.450	
Hotdog sandwich	93	3.0	11.233	1.099	.660	12.992	18.234	27.900	9.666	
French fries	743	24.0	41.615	4.725	.765	47.105	87.956	148.600	60.644	
Apple turnover	93	3.0	8.302	—	.347	8.649	13.762	18.600	4.838	
Total other items	960	31.0	66.585	7.339	2.015	75.939	128.902	207.500	78.598	
Coffee	121	3.9	4.816	—	—	1.044	5.860	12.440	18.150	5.710
Milk	45	1.5	4.545	—	—	.090	4.635	7.003	6.750	−.253
Milkshake	79	2.6	5.137	—	—	2.437	7.574	14.867	19.750	4.883
Orange drink	18	.6	.995	—	—	.119	1.114	2.227	4.500	2.273
Hot chocolate	26	.8	1.632	—	—	.024	1.656	3.141	3.900	.759
Carbonated drink	578	18.6	28.230	—	—	.740	28.970	62.580	144.500	81.920
Total beverages	867	28.0	45.355	—	—	4.454	49.809	102.258	197.550	95.292
Total all items	3,096	100.0	315.600	28.452	16.339	360.391	527.055	867.870	340.815	

<sup>1</sup> Overhead = total standard product costs — total standard prime costs — customer service task costs — general support task costs = \$527.055  
— \$360.391 — (\$0.740 per 100 items × 3,096 items) — (\$0.297 per 100 items × 3,096 items) = \$166.664 — \$22.910 — \$9.195 = \$124.559.